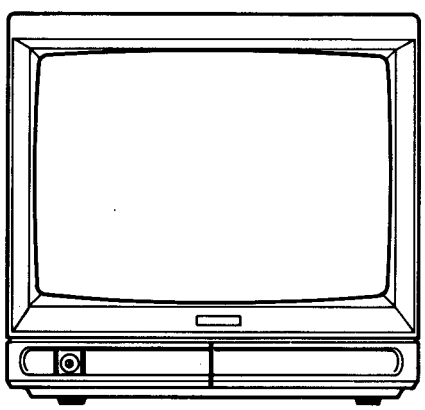
SHIVAKI

COLOUR TV
SERVICE MANUAL

CAUTION
BEFORE SERVICING THE CHASSIS, READ THE "SAFETY PRECAUTIONS" IN THIS MANUAL.



MODEL: STV-140M4
CHASSIS: PC-91A

P/N 483-664E

AUG., 1990

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SPECIFICATIONS

Power Consumption 70W
Receiving TV System ..... CCIR Standard

COLOUR RECEIVING SYSTEM		PAL/SECAM-B/G	PAL B/G-SECAM D/K	PAL-I	PAL-H
Intermediate Frequency	Picture	38.9 MHz	38.0 MHz	39.5 MHz	38.9 MHz
	Sound	33.4 MHz	31.5 MHz	33.5 MHz	33.4 MHz
	Colour	34.47 MHz	33.57 MHz	35.07 MHz	34.47 MHz
Receiving Channel	VHF Low	2–4 CH, S_1	1–5 CH	NONE	0–5 CH
	VHF High	5–12 CH, S_2-S_{25}	6–12 CH	NONE	5A–11 CH
	UHF	21–69 CH	21–69 CH	21–69 CH	21–69 CH
Power Source		220V/50Hz (SMPS)		240V/50Hz (SMPS)	

Tuning ..... Voltage Synthesizer
Audio Output ..... MAX. 4W
Antenna Input Impedance ..... 75 ohm IEC Type
(300 ohm using balun supplied)
Picture Tube A34KCQ12XX
Speaker ..... 92 × 92 mm
Dimension ..... 360(W) × 370(D) × 349(H) mm
Weight ..... 10.4 Kg

SAFETY PRECAUTIONS

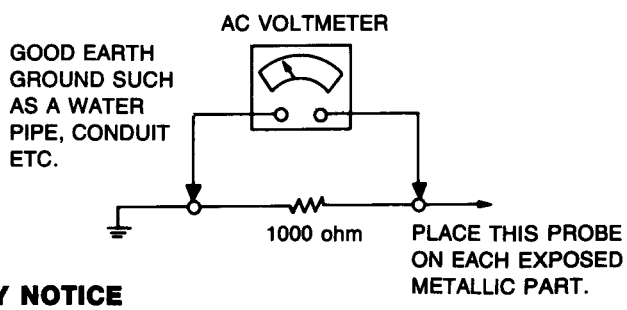
WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTIONS", "SAFETY INSTRUCTIONS" AND "PRODUCT SAFETY NOTICE" DESCRIBED BELOW.

X-RAY RADIATION PRECAUTIONS

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is 24 ± 1.5 kV at High beam current (maximun brightness) under specified power source. The high voltage must not, under any circumstances, exceed 27.5 KV. Each time a receiver requires servicing, the high voltage should be checked. It is recommended the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
3. Some parts in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

SAFETY INSTRUCTIONS

1. Potentials as high as 25,000—27,000 volts is present when this receiver is operating. Operation of the receiver outside the cabinet or with the back cover removed involves a shock hazard from the receiver.
   (1) Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment.
   (2) Always discharge the picture tube anode to the CHASSIS GROUND to reduce the shock hazard before removing the anode cap.
   (3) Perfectly discharge the high potentical of the picture tube before handling.
   (WARNING: Risk of implosion. Handle with care.)
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the chassis parts list only.
3. When replacing parts or circuit boards, wind the lead wires around terminals before soldering.
4. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10 mm. away from circuit board.
5. Keep wires away from high voltage or high temperature components.
6. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts, etc., to be sure the set is safe to operate without danger of electrical shock. Since this TV has AVC (Automatic Voltage Control) circuit, it may be operated nonadjustably within the voltage-area indicated in the label attached at back cover. (Do not use a line isolation transformer during this check.) Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner.
   Connect a 1000 ohm resistor between a known good earth ground, (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1000 ohm resistor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 1 volt RMS. This corresponds to 1 mA. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by ⚠ marks on the schematic diagram and the replacement parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY RADIATION.

SERVICING PRECAUTIONS

CAUTION: Before servicing receiver covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication. *NOTE:* If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. *Remember: Safety First.*

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before:
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
      CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. *Do not test high voltage by "drawing an arc".*
3. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. Do *not* spray chemicals on or near this receiver or any of its assemblies.
5. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator: 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 %-99 % strength).
   CAUTION: *This is a flammable mixture.*
   Unless specified otherwise in this service manual, lubrication of contacts is not required.
6. Do not defeat any plug/socket B + voltage interlocks equipped in receivers covered by this service manual.
7. Do *not* apply AC power to this receiver and/or any of its electrical assemblies unless *all* solid-state device heat sinks are correctly installed.
8. Always connect the test receiver ground lead to the receiver chassis ground *before* connecting the test receiver positive lead.
   Always remove the test receiver ground lead *last.*
9. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do *not* connect the test fixture ground strap to any heatsink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices.* Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity:

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge build-up or exposure of the assembly.
3. Use only a *grounded-tip* soldering iron to solder or unsolder ES devices.
4. Use only an *anti-static* type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficent to damage ES devices.
5. Do *not* use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do *not* remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach the normal temperature (500 °F to 600 °F).
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
      CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach the normal temperature (500 °F to 600 °F).
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.

c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.

d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Removal/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/ Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output Transistor Device Removal/ Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heatsink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicularly to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/ Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board, to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board, causing the foil to separate from, or "lift-off", the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections, use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections):

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary.)
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the cut-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area, and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

BLUE: NEUTRAL BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

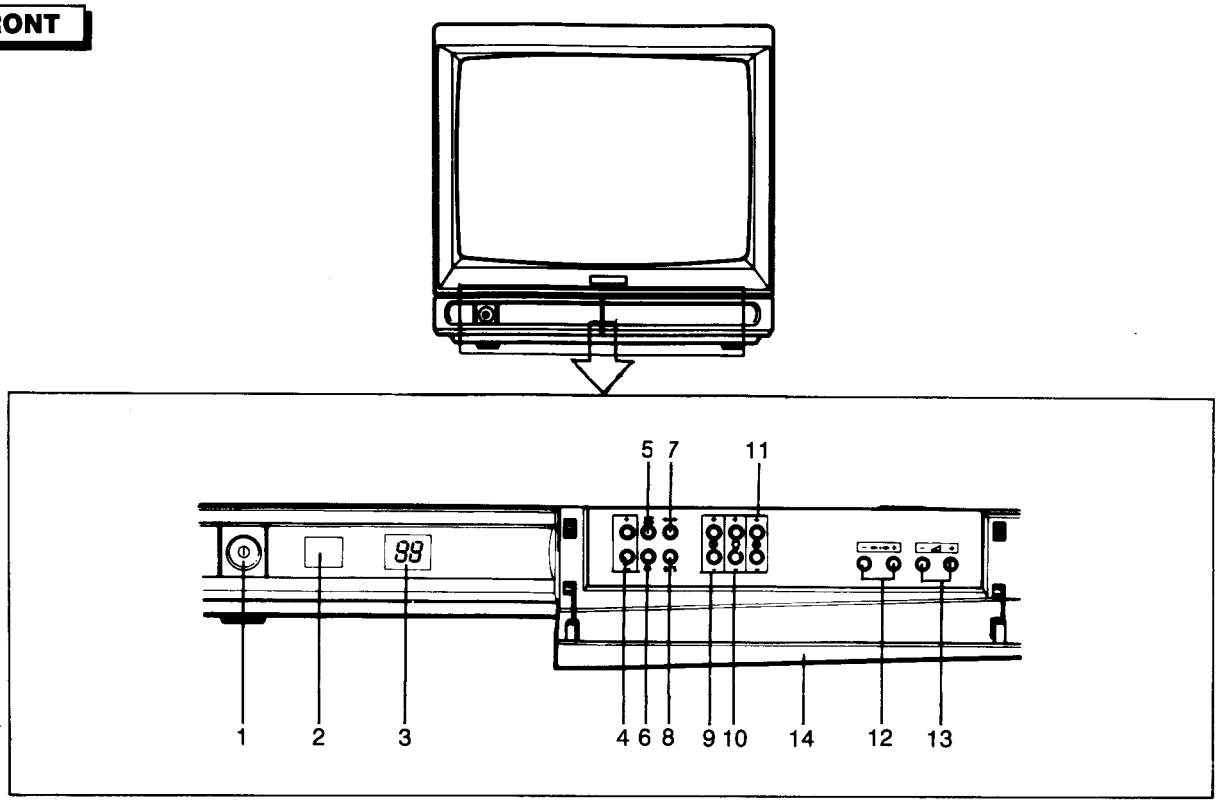
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

If a 13 Amp (BS1363) Plug or any other type of Plug is used a 5 Amp Fuse must be fitted, either in the Plug or Adapter, or on the Distribution board.

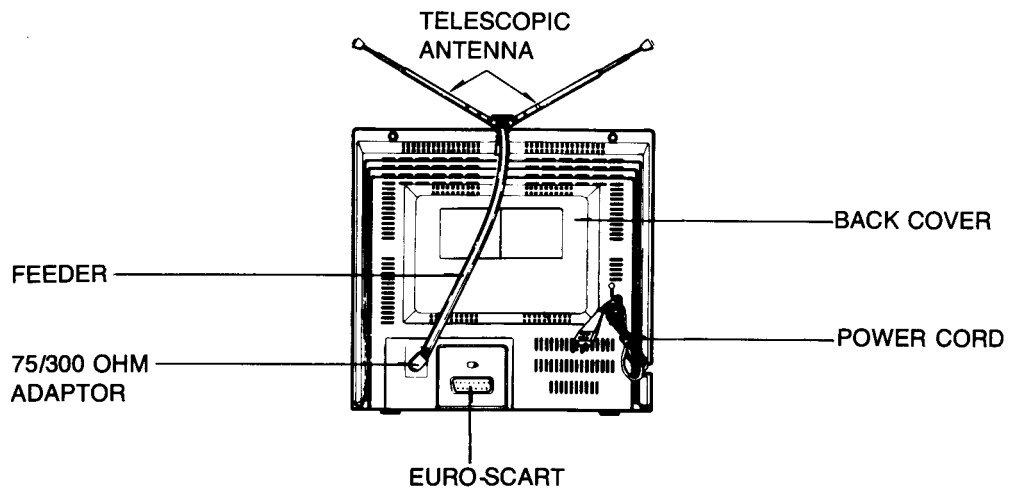
CONTROLS LOCATION

FRONT



1.	POWER ON/OFF BUTTON	8.	BAND SELECTOR (ONLY PAL-B/G, SECAM-D/K)
2.	REMOTE CONTROL SENSOR	9.	CONTRAST UP/DOWN BUTTONS
3.	PROGRAM NUMBER INDICATOR	10.	BRIGHTNESS UP/DOWN BUTTONS
4.	SEARCH UP/DOWN BUTTONS	11.	COLOUR UP/DOWN BUTTONS
5.	MUTE BUTTON	12.	CHANNEL/PROGRAM UP/DOWN BUTTONS
6.	MEMORY BUTTON	13.	VOLUME UP/DOWN BUTTONS
7.	NORMAL BUTTON	14.	CONTROL DOOR

BACK



DISASSEMBLY INSTRUCTIONS

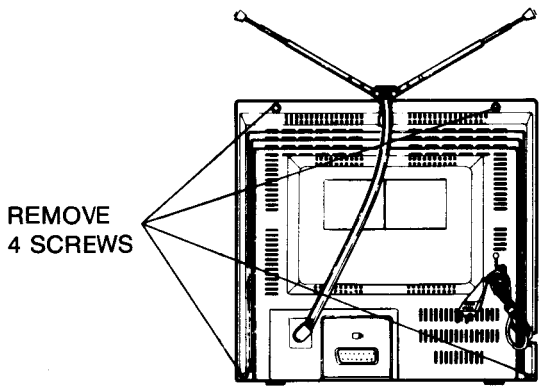
BACK CABINET REMOVAL
Remove 4 screws holding on back cabinet and carefully separate the back cabinet from the front cabinet.

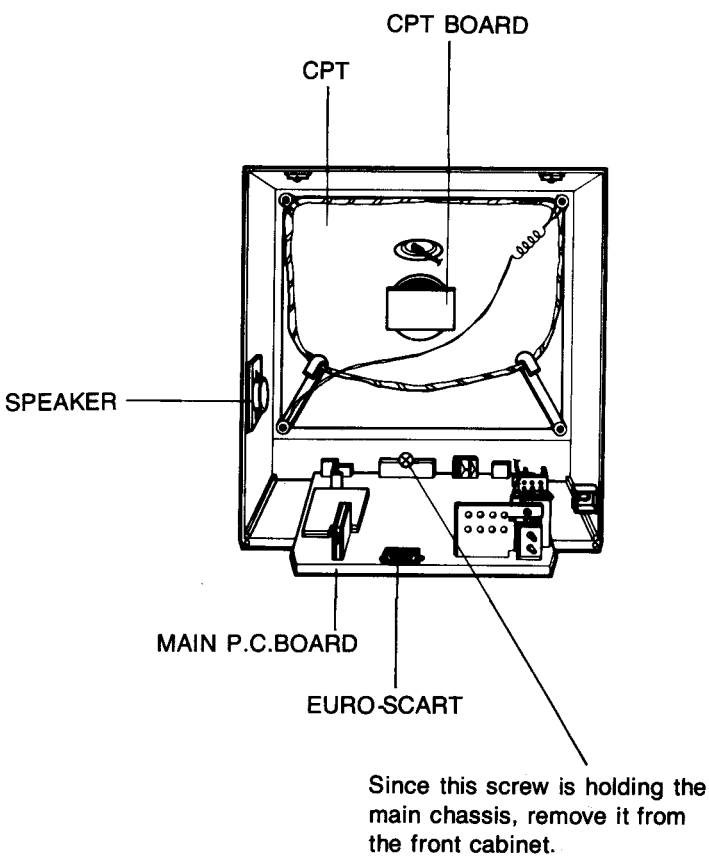
MAIN CHASSIS REMOVAL
1. Remove a screw holding the main chassis.
2. Grasp both sides of main chassis, pull it backward

SPEAKER ASSY REMOVAL
1. Remove PS01 connector between the speaker and the main chassis.
2. Pull out the speaker assy from the front cabinet.

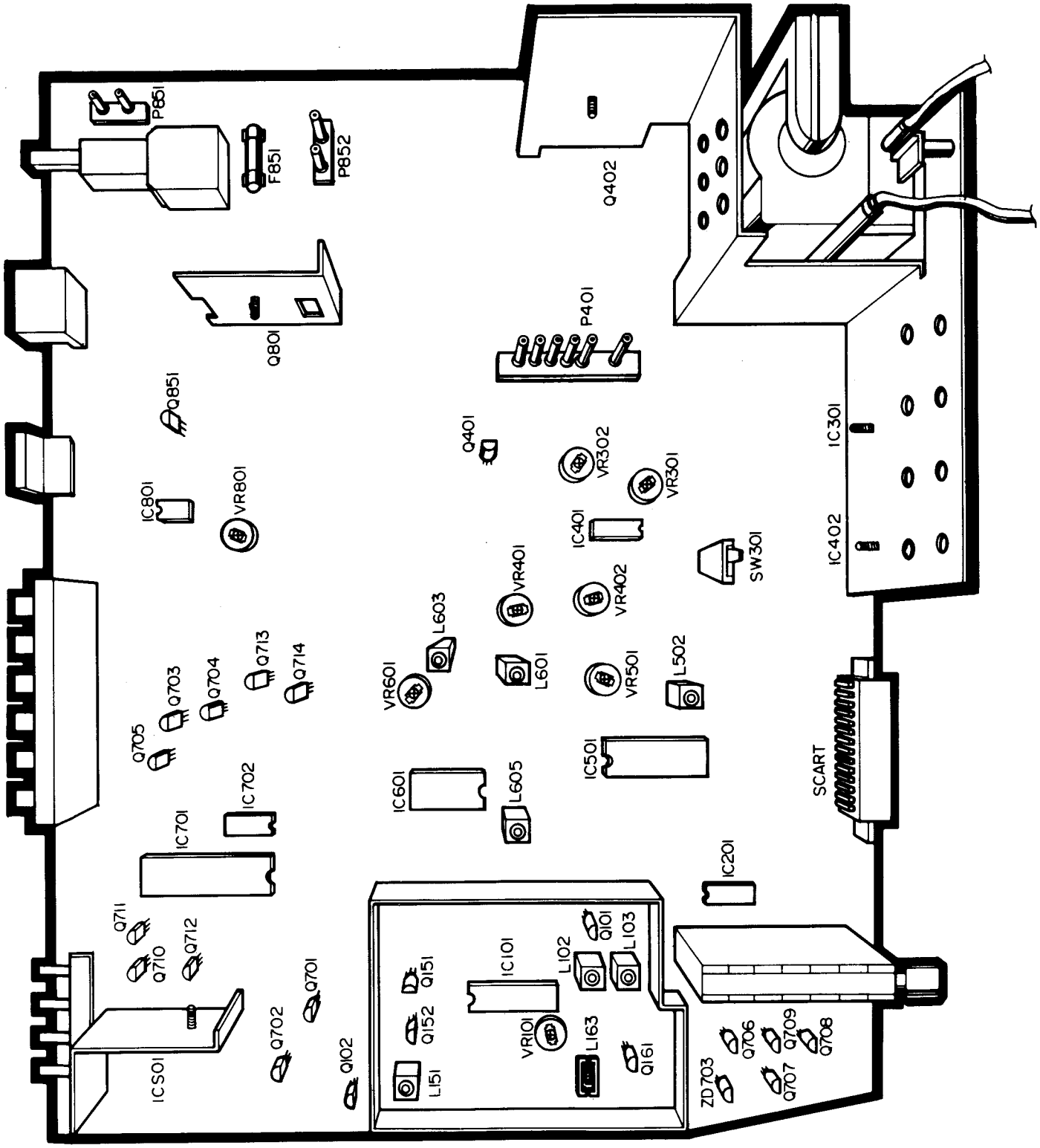
CPT REMOVAL
1. Pull out the CPT board from CPT neck.
2. Place the front cabinet on soft material so as not to mar the front surface or damage the control knobs.
3. Remove 4 nuts securing the picture tube mounting brackets to the front cabinet.
4. Carefully separate the CPT from the cabinet front.

PICTURE TUBE HANDLING CAUTION
Due to the high vacuum and large surface area of the picture tube, great care must be exercised when handling the picture tube.
Always lift the picture tube by grasping it firmly around faceplate.
NEVER LIFT TUBE BY ITS NECK. The picture tube must not be scratched or subjected excessive pressure as the fracture of glass may result in an implosion of considerable violence which can cause personal injury or properly damage.





PARTS LOCATION DIAGRAM OF MAIN CHASSIS



ADJUSTMENT INSTRUCTIONS

1. APPLICATION SPHERE

This instruction applies to all the kinds of the colour television with PC91A chassis.

2. SPECIFICATION

1) Circumference Condition
   If there is no particular guidence, adjust PC91A chassis as follows.
   - Appropriate Temperature: 20°C ±5°C
   - Relative Humidity: 65% ±5%
2) Necessary Instruments
   - DC Power Supplier 0-20V/1A: 2EA
   - Sweep Generator and Marker Unit of Each System
   - Alignment Scope
   - DC Voltmeter (High Impedance)
   - PM5518 (PHILIPS PATTERN GENERATOR)
   - Frequency Counter
3) Signal
   - In this case, standard colour signal means GoldStar standard digital signal (PM5544 DIGITAL)
4) Power Source (Receiver Operation)
   AC 180V-270V,, 60/50Hz.

3. VIF ALIGNMENT PROCEDURE

1) Connecting Block Diagram of Equipments

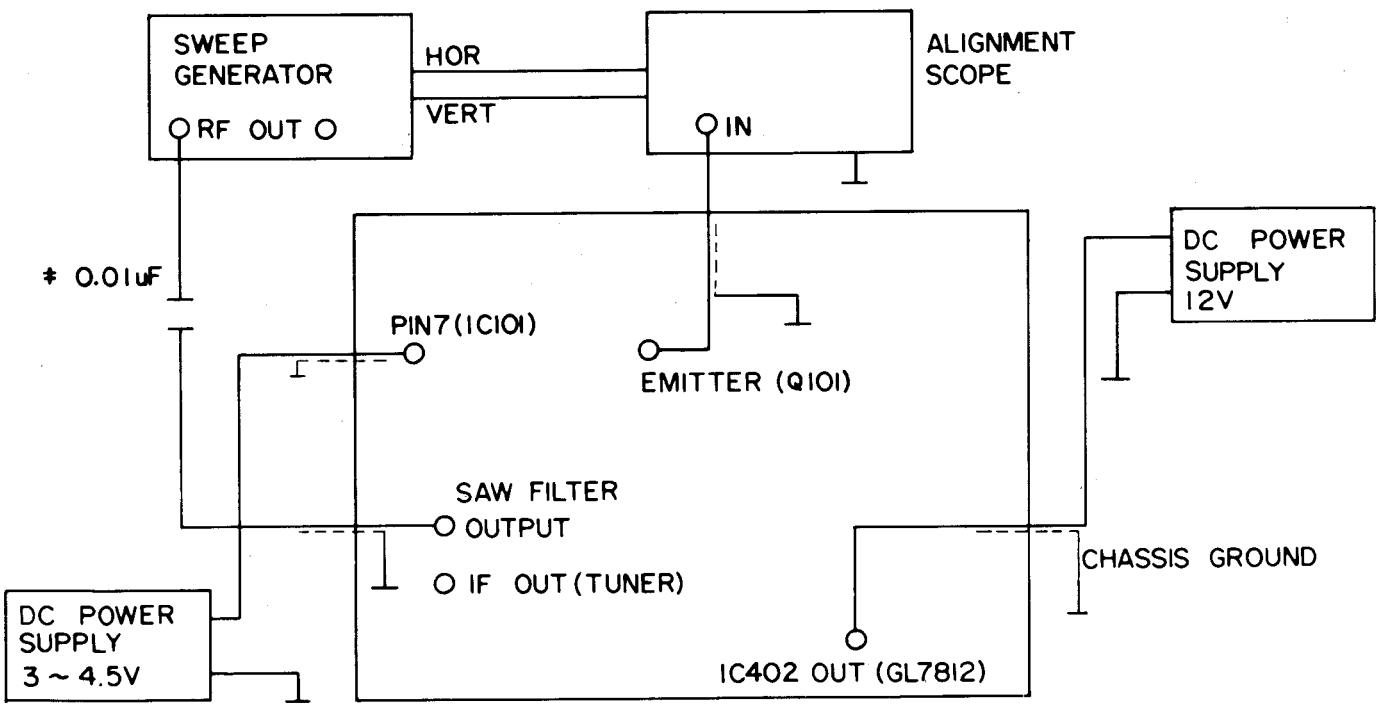


Figure 1

* Connect Ceramic Capacitor (0.01uF) between RF-OUT terminal of the Sweep Generator and Out terminal of Saw Filter as shown in figure 1.

2) VIF Detection Coil Alignment
   - Connect the equipments to the main board as shown in figure 1, and then turn the DC power supplier on.

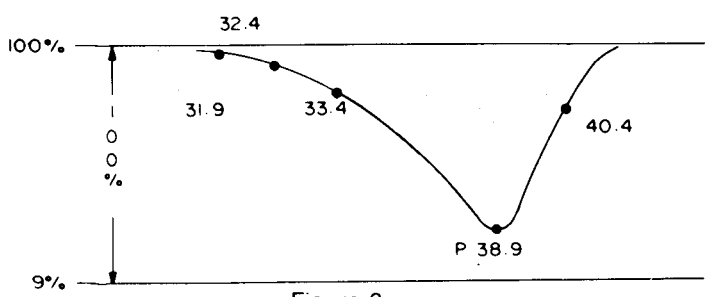


Figure 2

- Adjust L102 ((Detection Special Quality Adjustment Coil) on the main board in order to minimize the Picture Carrier Mark as shown in figure 2 (For Mark Frequency of Each System, refer to the below note (*)).

* Each frequence carrier of system

PAL B/G:	38.9 MHz
PAL I:	39.5 MHz
PAL I/I:	39.5 MHz
PAL/SECAM B/G:	38.9 MHz
PAL B/G+SECAM D/K:	**38.0 MHz**

4. ASC (40.4 MHz) ALIGNMENT PROCEDURE (L162)

1) This alignment is only applicable to the model with ASC TRAP for FTZ.
2) Do connecting Block Diagram of Equipments as shown in figure 1, but connect RF-OUT terminal of the sweep Gererator to IF-OUTPUT terminal of the TUNER on the Main PCB.
3) Turn L162 counterclockwise so that it may appear to maximum, and then adjust it clockwise slowly.
   NOTE: You have to use this adjustment after C168 and AFT terminal of the tuner open (SLIT1, SLIT3).
4) After setting output of sweep GENERTOR to maximum, apply about 5V to IF AGC voltage of pin7 (IC101) so that waveform may be distingished L162 in the saturated state.
5) Adjust L162 so that 40.4 MHz Point may be minimum.

5. AFT ALIGNMENT PROCEDURE

NOTE) AFT algnment must be acted with C168 and AFT Terminal of TUNER open (SLIT1, SLIT3)

1) Connecting Block Diagram of Equipments for AFT is the same procedure as that for VIF, but change Connection Position of Alignment scope from Emitter of Q101 to AFT Terminal of TUNER.
2) Set Vertical Gain of the Scope to 1Vp-p/div and set the Sweep Generator Output to a low state possibly.
3) Adjust L103 so that AFT adjustment waveform may be as shown in figure 3.
4) After finishing adjustment, connect C168 and AFT terminal of the TUNER to SLIT 1 and SLIT 3.

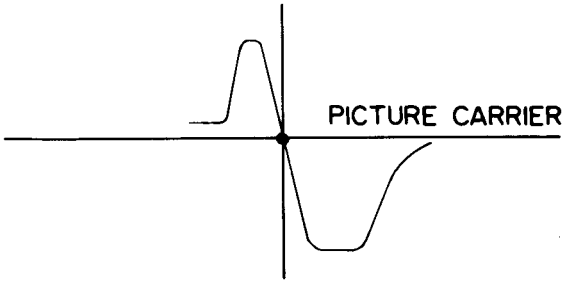


Figure 3 (AFT Alignment Waveform)

6. MAIN B+ (112V DC) ALIGNMENT

1) Put the set in motion normally.
2) Receive the standard colour signal.
3) Set the postion of the colour, bright, contrast to maximum.
4) Adjust the VR801 so that the voltage of TP1(J1) may be 112V.

7. HORIZONTAL SYNCHRONIZATION (HOR. OSC ALIGNMENT)

1) Let the FUBK TEST PATTERN send to the TUNER ANTENNA.
2) Connect the SYNC. SEPARATION INPUT SIGNAL to the GROUND. (Connect pin 5 of IC401 to GROUND)
3) Adjust VR402 so that a screen may be maintained in a horizontal and vertical direction.
4) Remove the pin 5 connection of IC401 to GROUND.

8. HORIZONTAL CENTER ALIGNMENT (HOR. SHIFT ALIGNMENT)

1) Receive the FUBK TEST PATTERN.
2) Adjust the VR401 so that the center of a screen may be adjusted.

9. VERTICAL AMPLITUDE AND LINEARITY ALIGNMENT (VERT. HEIGHT AND LINEARITY ALIGNMENT)

1) When brightness of a screen is maximum by receiving the FUBK test pattern, adjust VR302 so that the outline signal of upper and lower parts of great circle on screen may coincide with the edge of an effective CPT screen.
2) Again, change the signal into DIGITAL PATTERN, and adjust VR301 so that the length of upper and lower of the great circle may be equal.

10. VERTICAL CENTER ALIGNMENT

1) Ajust the SW301 (VERT. CENTER SVC. S/W) so that the center of the pattern coincide with the center of an effective CPT screen vertically.

11. COLOUR SYNCHRONIZATION ALIGNMENT

1) Reveive the standard COLOUR BAR signal.
2) Set the contrast, brightness and colour VR to maximum.
3) Connect the colour saturation terminal (PIN 6 of IC501) to 12V.
4) Short the pin 21 (B-Y) and the pin 22 (R-Y) of IC501. (Short between TP7 and TP8.)
5) Adjust the TC501 so that the colour bars may not appear.
6) After finishing adjustment, remove the connection of item 3) and 4).

12. PAL MATRIX ALIGNMENT

1) Set the contrast, brightness and colour VR to maximum
2) Receive DEM. PATTERN
3) Connect SCOPE to B-OUT (The pin 16 of IC501).
4) Adjust VR502 to obtain a minimum fluctuation (A straight line) as shown in figure 4-1.

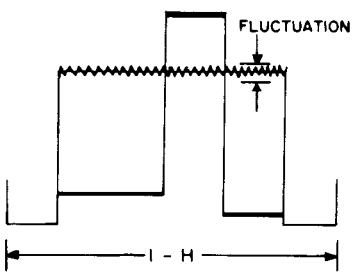


Figure 4-1 VR502 Alignment

5) Adjust L502 to obtain a minimum fluctuation as shown in figure 4-2 after changing PATTERN into the COLOUR BAR singal.

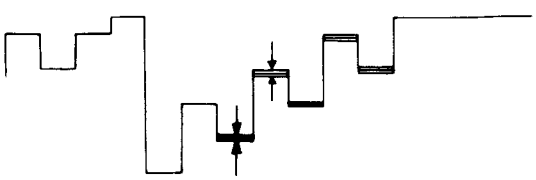


Figure 4-2 L502 Alignment

6) Repeat above item 4), 5) again.

13. RF AGC ALIGNMENT

1) Receive the standard colour signal (60dB ± 1dB).
2) Connect DIGITAL MULTIMENTER to AGC Terminal of TUNER.
3) Refer to a below diagram, and then adjust VR101.

TUNTER SYSTEM	B/G-D/K	I	I-I	H
SHARP	5.5 ± 0.1dc	X	X	
APLS	4.5 ± 0.1dc	4.5 ± 0.1dc	4.0 ± 0.1dc	6.0 ± 0.1dc

14. SCREEN AND WHITE BALANCE ALIGNMENT

1) Set the colour, brightness and contrast control to minimum.
2) Set the BIAS ALIGNMENT VR on the CPT board to minimum and the DRIVE ALIGNMENT VR(904-905) to the mechanical center position.
3) Receive the standard pattern.
4) SHORT between TP2 and TP3 to remove the vertical deflection and adjust SCREEN VR to obtain horizontal line on screen. And then, control BIAS VR so that WHITE BAR appears.
5) Adjust the screen so that the value of SCREEN VR may be lower and WHITE BAR almost disappear.
6) Remove the short between TP2 and TP3, adjust the drive control VR(VR904, 905) in the high light state to get white balance.
7) After adjusting the contrast, brightness control VR, continue to control the low light and high light until white remains.
8) Adjust 8000K ± 800K (X = 296 ± 8, Y = 306 ± 8) to control colour analyzer.

15. FOCUS ALIGNMENT

1) Receive the standard DIGITAL PATTERN, and then set the colour, brightness and control to maximum.
2) Adjust slowly the FOCUS control on the FBT so that the HALO phenomenon may not appear around center and letter.

16. SECAM BOARD ALIGNMENT

1) SECAM BELL FILTER ALIGNMENT
(1) Receive SECAM COLOUR BAR PATTERN.
(2) Connect LOW CAPACIRANCE PROBE to pin 3 of IC601.
(3) Adjust L601 to maximize and flatten the waveform.
(4) In case of not using FET PROBE, perform above adjustment (number 1 to 3) by the GS standard SECAM SIGNAL so that the COLOUR of 3.8 MHz portion may be red and minimize the colour of the COLOUR BAR MAGENTA on the shadow of LEVEL BAR boundary.
2) SECAM REFERENCE COIL ALIGNMENT.
(1) Connect OSCILLOSCOPE PROBE to pin 9 (J63) of IC601.
(2) Adjust L605 to minimize ① portion of waveform A and then change it into DIGITAL PATTERN to adjust the colour by maked eyes.

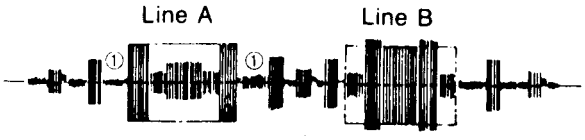


Figure 5

2) SECAM COLOUR SYNC ALIGNMENT (4.43 MHz OSC ALIGNMENT)
(1) After fishing the PAL DECODER COLOUR SYNC alignment, adjust it.
(2) Receive the Standard SECAM COLOUR BAR when item 2) and 4) of Colour Synchronization Alignment is acted.
(3) Adjust TC601 so that the colour bar doesn't flow down.
(4) Remove the connection item 2) and 4).
3) 1H-DELAY LINE ALIGNMENT
(1) Send the SECAM COLOUR BAR SIGNAL to the antenna and adjust colour +/− so that colour level may be the mechanical center set.
(2) Connect oscilloscope probe to pin 6 of the IC501.
(3) Adjust VR601 to waveform A in figure 6.
(4) Adjust L603 to minimum fluctuation as shown in figure 6.

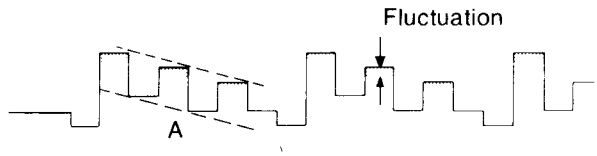


Figure 6

17. SOUND CONVERTER (5.5 MHz/6.5 MHz) ALIGNMENT (only SECAM-D/K)

1) Open SLIT2.
2) Connect Frequency Counter to Cathode of D151. (In this case, be sure to use OSCILLOSCOPE PROBE (10:1) in connection)
3) Adjust Coil (L151) so that the Value of Frequency Counter may be 500 ± 0.1 KHz.
4) After finishing alignment, short SLIT2.

PURITY AND CONVERGENCE ADJUSTMENT

CAUTION: Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments. However, the effects of adjacent receiver components, or replacement of picture tube or deflection yoke may require the need to readjust purity and convergence. Convergence magnet assembly and rubber wedges need mechanical positioning following the figure 7. Before attempting any convergence adjustments this receiver should be operated for at least fifteen minutes. If adjustment is required the adjustments should be made in the following sequence.

COLOUR PURITY ADJUSTMENT

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Turn the CONTRAST and BRIGHTNESS controls to maximum.
3. Select the purity pattern consisted of green only on the pattern generator.
4. Loosen the clamp screw holding the yoke, and slide the yoke backward to provide vertical green belt (zone) in the picture screen.
5. Remove the Rubber Wedges.
6. Rotate and spread the tabs of the purity magnet (See figure 8) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, center the raster vertically.
7. Move the yoke slowly forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8. Check purity of the red and blue rasters by selecting the purity pattern of pattern generator.
9. Obtain a white raster, refering to "WHITE BALANCE ADJUSTMENT".
10. Proceed with convergence adjustment.

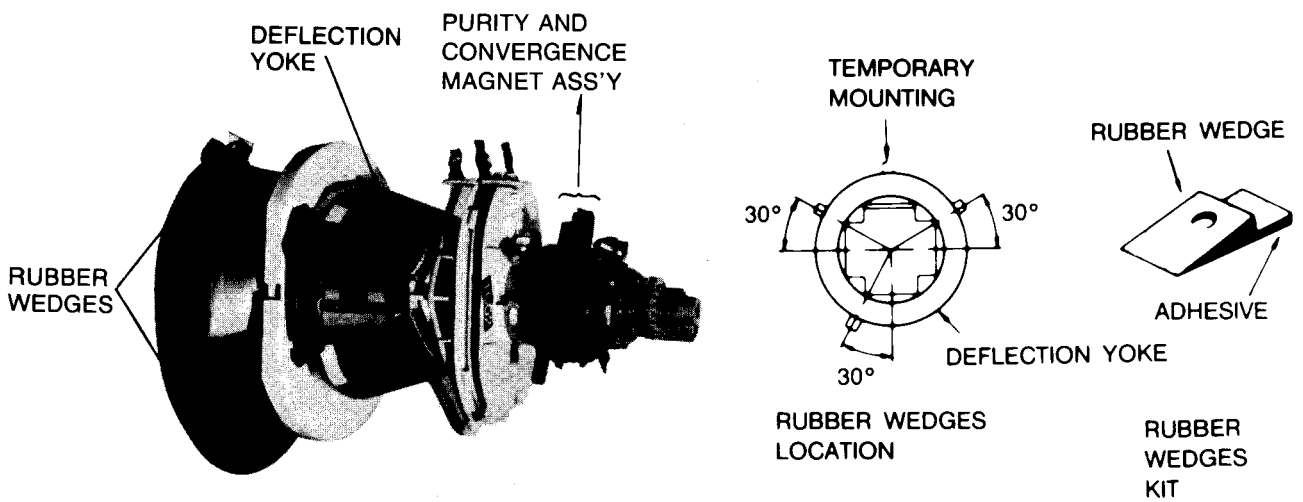


Figure 7

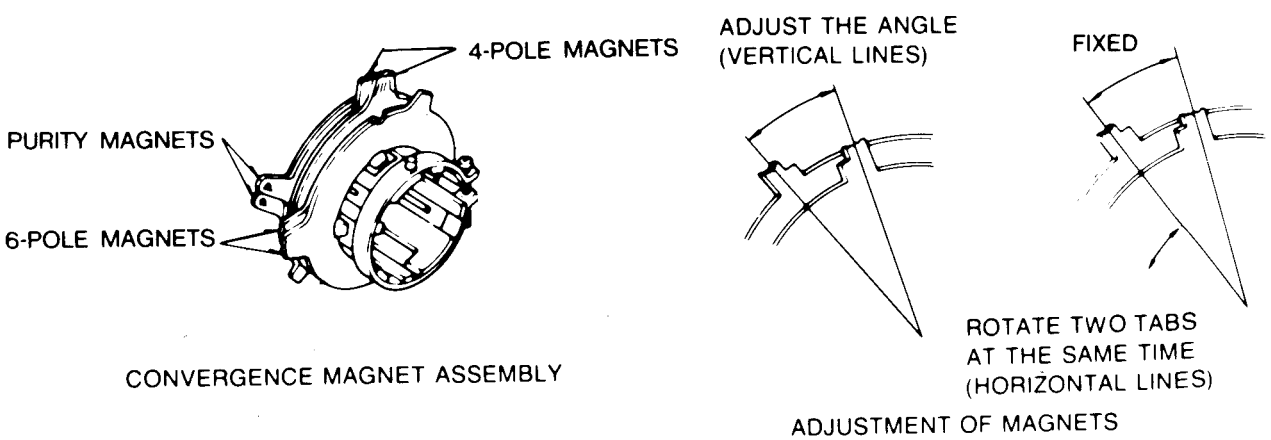


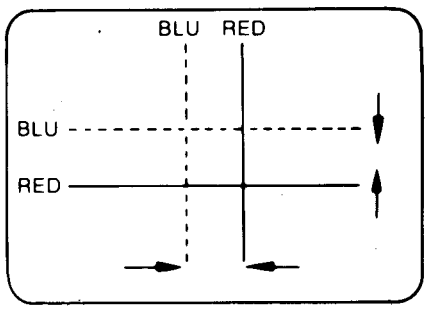
Figure 8

CENTER CONVERGENCE ADJUSTMENT

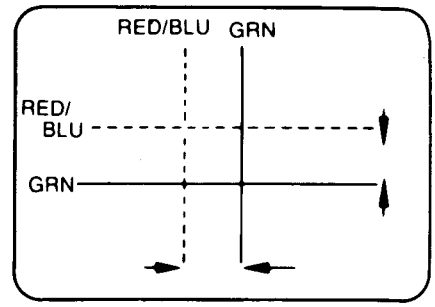
1. Receive crosshatch pattern with a colour bar signal generator.
2. Adjust the BRIGHTNESS and CONTRAST controls for well defined pattern.
3. Adjust two tabs of the 4-pole magnets to change the angle between them (See figure 8) and superimpose the red and blue vertical lines in the center area of the picture screen. (See figure 9.)
4. Turn both tabs at the same time keeping their angles constant to superimpose red and blue horizontal lines at the center of the screen. (See figure 9)
5. Adjust two tabs of 6-pole magnets to superimpose red/blue line with green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 1,2,3, keeping in mind red, green and blue movements, because 4-Pole magnets and 6-Pole magnets interact and make dot movement complex.

CIRCUMFERENCE CONVERGENCE ADJUSTMENT

1. Loosen the clamping screw of DY to allow the yoke to tilt.
2. Adjust DY to obtain a better convergence in the circumference by orbital movement of the front of the yoke, then secure the DY in appropriate position by placing the wedges as illustrates in figure 7. Tighten screw holding the DY. Stick 3 adhesive tapes on wedges as shown in figure 7.

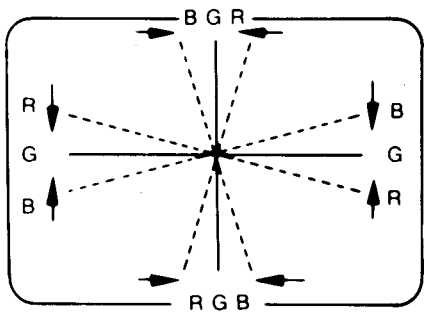


4-Pole Magnets Movement

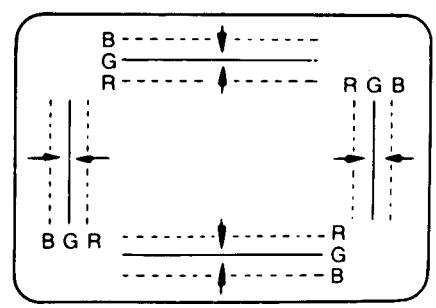


6-Pole Magnets Movement

Center Convergence by Convergence Magnets



Incline the Yoke up (or down)



Incline the Yoke right (or left)

Circumference Convergence by Deflection Yoke

Figure 9 DOT MOVEMENT PATTERN

CIRCUIT DESCRIPTIONS

VIDEO SIGNAL SYSTEM CIRCUIT

Video Signal System contains Tuner, Video IF AMP., Video DET., Video AMP., AGC Circuit and AFT Circuit. In this chassis, all functions except Tuner are performed within IC101 (GL3120A/LA7520).

Video DET, Video IF AMP, Circuit and Video AMP, Circuit

All functions are performed in IC101. The schematic diagram is below.

GL3120A/LA7520 used in this Chassis is a large-scale integrator which contains the VIF stage, SIF stage and Sound stage, and reduces 5.5(PAL-I: 6.0, SECAM D/K: 6.5)MHz Beat.

At the same time, GL3120A/LA7520(IC101) improves the sound quality and the picture quality compared with a conventional chassis as a result of detecting the sound in Quadrature DET. Circuit.

Video/Sound (5.5MHz, D/K: 6.5 MHz, PAL-I: 6.0MHz) DET. Circuit

The IF signal which is fed to IC101 is amplified in the IF AMP. circuit, and detected in the SIF DET. circuit, so it creates the 5.5(PAL-I: 6.0, SECAM D/K: 6.5) MHz SIF signal.

Also, after the amplified signal passes the Buffer Circuit, and creates the Video signal, detected in the DET. circuit.

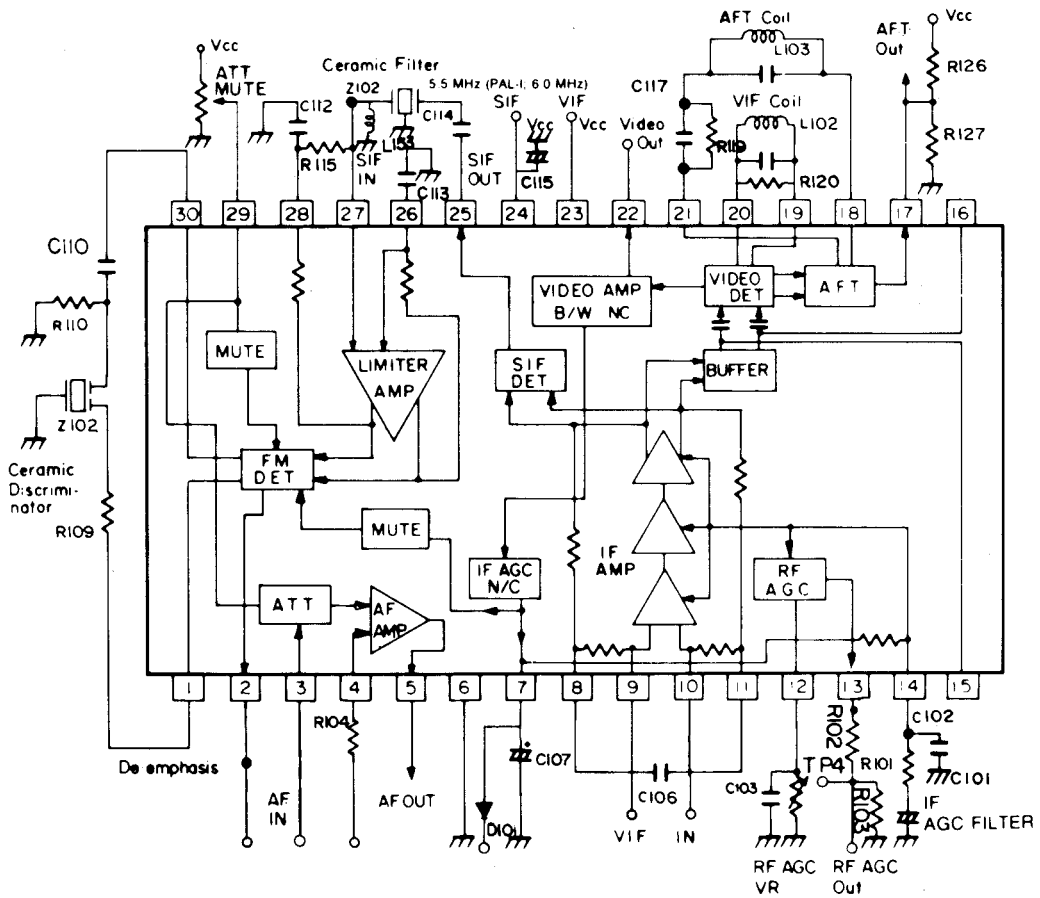
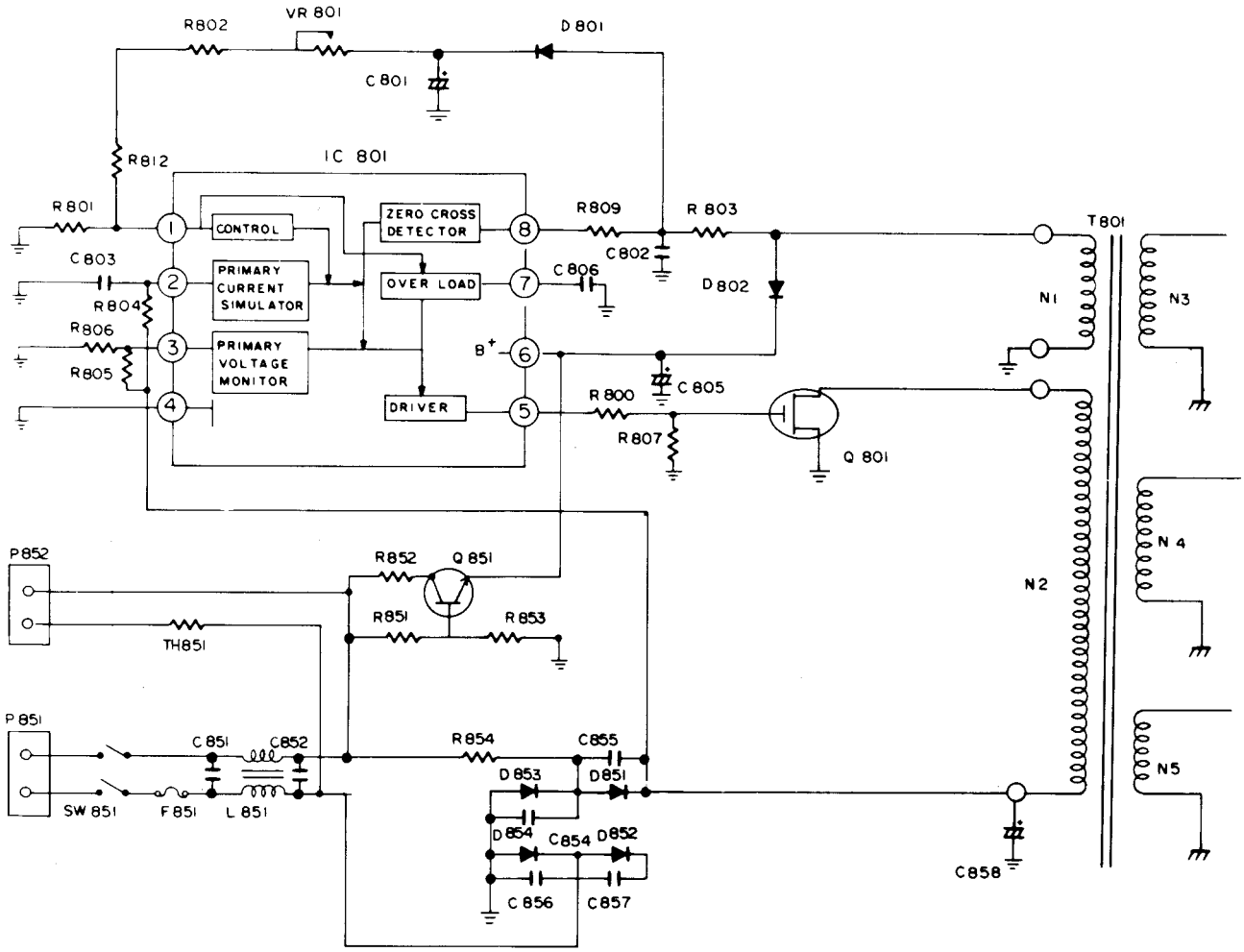


Figure 10 Schematic Diagram of IC101 (GL3120A/LA7520)

Pin Function Chart of IC101 (GL3120A/LA7520)

Pin No.	Description
1, 30	FM detector, pin 1 and 30, uses the quadrature detection circuit. After the signal, with its amplitude limited by the limit Amp, is output from pin 1 and 90° shifted by the phase shifter, it is input at pin 30.
2	Quadrature detected signal is output at pin 2 through emitter follower.
3	DC VR input terminal pin 3 attenuates the audio signal.
4	The sound Amp. NFB (Negative Feed-back) terminal.
5	The sound output terminal.
6	The ground terminal, and is connected to the ground of the SAW filter.
7, 14	IF AGC Filter terminals (PIN 7), RF AGC Filter terminal (PIN 14). Pin 7 is also used as the video and audio mute terminal.
8, 11	By-pass AC signal contained in VIF Amp signal.
9, 10	VIF input terminals.
12	The RF AGC VR (Variable Resistor) terminal. VR101 is connected as the RF AGC VR.
13	The output of RF AGC. When the RF AGC voltage is below 9 V, R102 and R103 divide the Resistance and C104 is necessary to stop the oscillator.
15, 16	
17	The AFT DC voltage from pin 17 is varied by R126 and R127.
18, 21	AFT circuit is the quadrature detection circuit and is connected between the pin 18 and pin 21.
19, 20	The carrier element is taken out from the LC tank circuit through pins 19 and 20.
22	The video ouptut terminal.
23, 24	These are the supply voltage input terminals. Pin 23 = VIF block Pin 24 = SIF block
25	The SIF primary detection output terminal.
26, 27, 28	Pins 26 and 28 are by-pass ground terminals. Pin 27 is the unbalanced input terminal.
29	The mute & sound volume control terminal.

POWER SUPPLY



Start Up

If you turn the switch on, the voltage generated by R851 and R853 inputs the BASE of the Q851 for a half period of the upper side frequency wave which corresponds with 50Hz. If that happens, about 8 volts is generated in the emitter of Q851. After all, this voltage input the pin 6 of the IC801 to turn it on. And then, the DC 12—18 volts rectified by the D802 and C805 input the pin 6 continuously. At last the IC801 operates normally.

Normal Operation

The square wave output power which make the Q801 on and off flows out of the pin 5. Also, the sources generated by the load variation are detected from the wire wound (N1). The detected variation sources which is communated with the D801 and the C801 input the voltage to the pin 1.
The pin 1, 2 and the pin 3 have the function assisting the control operation. And adjusting VR801 makes the secondary output voltage controlled.

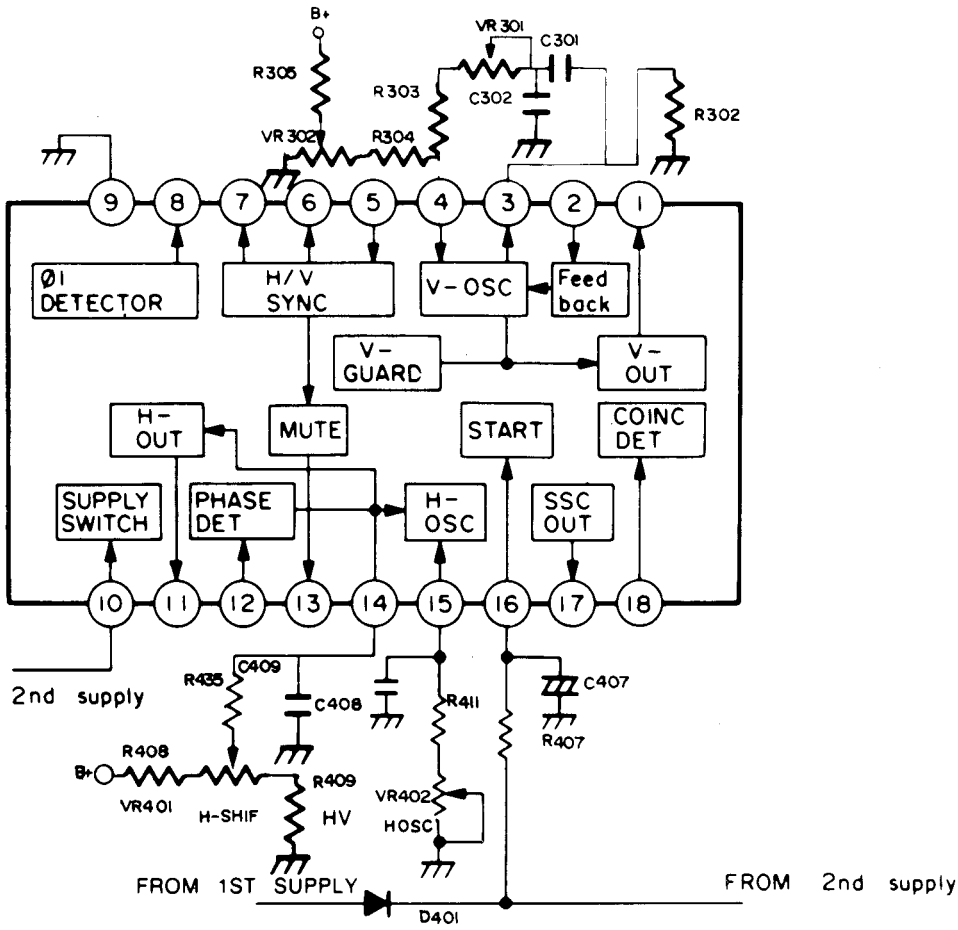
Over Load Operation

The maximum COLLECTOR current is decided by the pin 1 and the pin 6 of the IC801. If the secondary load is too exceeded, the decrease of voltage generated from N1 makes voltage of the pin 6 and the pin 1 of IC801 decrease and output pluse width of pin 5 extremly.

High Voltage Protection

This is decided by voltage of the pin 1 and the pin 6. If the secondary voltage increase above the fixed voltage, the voltage of N1 increase. When this voltage is above 15V, the motion of pin 5 output will stop.

H/V DEFLECTION



Start Up

If you turn the switch on, the output power of the 17 volts in the part of electric power source flow into the pin 16 of the IC401 through the D807. Therefore, the IC401 begins oscillating and its output-power flows from the pin 11. In the result, the horizontal output-power of TR. Q401 is driven, and the second voltages from the FBT to the D403 and D404 are commutated. The 12 volts through the constant voltages, are input to the pin 10 of the IC401 and perform the IC401 in normal motion. On the other hand, when the 2nd supply are input to the pin 16 of the IC401. By cutting off an end of the D807, separate the part of electric power from the first voltage.

Vertical Section

The pin 3 and the pin 4 perform their duties of oscillating SAW-TOOTH WAVE. That is to say, the pin 4 makes the NFB (negative feed back) information which the pin 2 generates though the vertical output-power circuit overlap C301 and C302 of the pin 3 and corrects a verticality. The pin 1 is a vertical output-power terminal. The sources of the vertical saw-tooth-wave is finished to the vertical output circuit through this terminal.

Horizontal OSC and Phase Shift

The Oscillation signal, which is generated by C408, R411 and VR402 connecting to the pin 15, makes the horizontal synchronizing signal which is detected by the pin 6, pin 7 and pin 8 among the image signals from the pin 5 compared with a part of vertical output-power signal from the pin 12. And than the last signal output-power generated. In that case, the phase is shifted by C408 and VR401 connecting to the pin 14.

A/V MODE

If you make the pin 18 low through R414, the movement of 2 DETECTOR flows FAST mode so that it is LOCKING and VCR mode.
Therefore, when Audio/Video is seleted by R414, D402 and the HIGH LEVEL is applied to the pin 8 connecting to Peri Plug, VCR mode is selected.

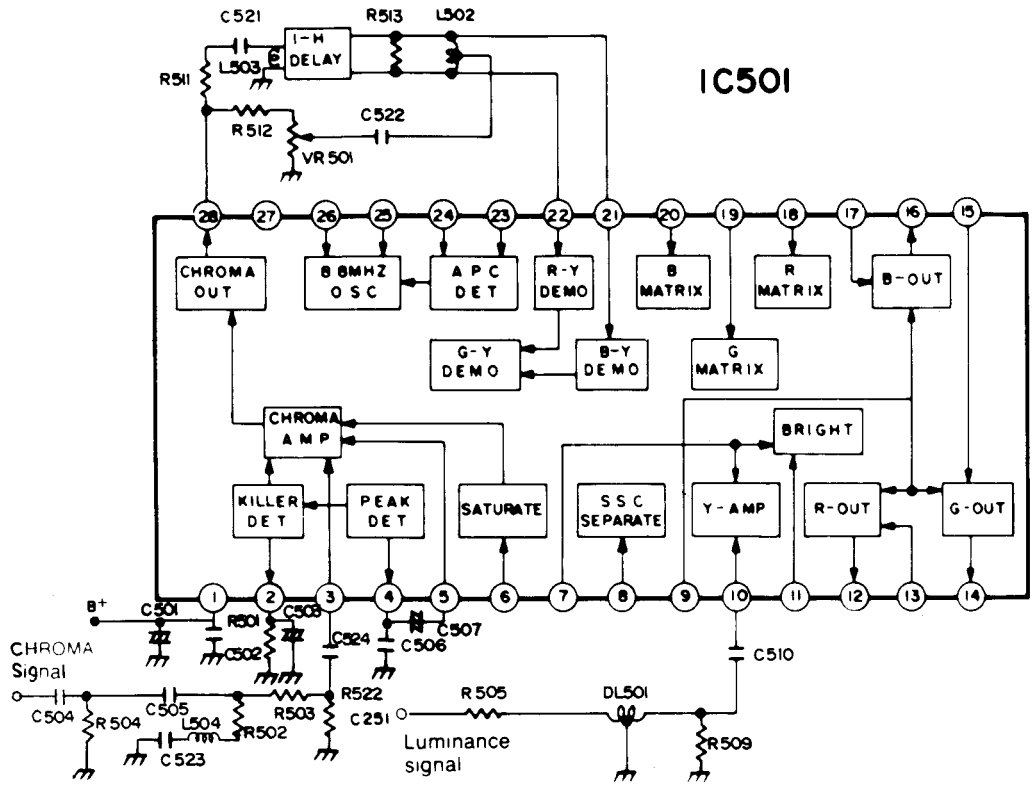
Sand Castle

The Output of three level sand castle from the pin 17 of IC401 flows into the pin 8 of IC501 (PAL Chroma IC), and pin 4, 19 of IC601 (SECAM charoma IC).

Synchronization Separation and Slice Level

R405 and R406 connecting to the pin 5 determine the value of direct voltage and fix slice level and select the horizontal synchronization signal among the image signals or negative going synchronization pulse inputting the pin 5.

CHROMA & LUMINANCE



Chroma Path

First, the CHROMA signal flows from B.P.F. Circuit into the pin 3 to be amplified, and then it flows into the second amplifier to do about 4 Vp-p. The amplifier signal which is in output from the pin 28 is divided into two groups. One flows from R511, C521 into 1H-Delay Line, the other from R512, VR501 and C522 into mid-tap of L502.

At L502, two kinds of signal, which flows from 1-H delay and not, is vectored and adjusted, so that R-Y (u) signal is divided into B-Y (u) and B-Y (V).

Each of the signals is demodulated inside the pins 21, 22. G-Y is generated by R-Y and B-Y.

In course of demodulation, colour system is a Carrier Wave Suppression, therefore the pins 25, 26 oscillate to 8.86 MHz to reconstitute a carrier wave.

The DC voltage which the Colour Burst of the pins 23, 24 generates flow into oscillator for 8.86 MHz and adjust the oscillating frequency and the false image so that they may concide with original signal.

After the 8.86 MHz which is generated in this way decrease by half, R-Y and B-Y flow into G-Y demodulator in order to generate a complete demodulation. On the other hand, the pin 2 discharges its duty of controlling the first amplifier of an outcome so that colour killer does not generate colour noise during receiving black and white signal or in electric field less than 35 dBm.

That is to say, the pin 4 detects the colour Burst and makes it generate DC voltage, which is supplied and controlled on the pin 2, and kills the DC volage of the pin 2 less than 3 V. The pin 6 is a saturation control circuit.

Luminance Path

As much as chroma path needs to perform chroma signal, DL501 delays Luminance signal about 380 nS., and then this flows into the pin 10 through C510 and control contrast, brightness with the pin 7 and the pin 11 to be supplied for each of R, G, B matrix circuit.

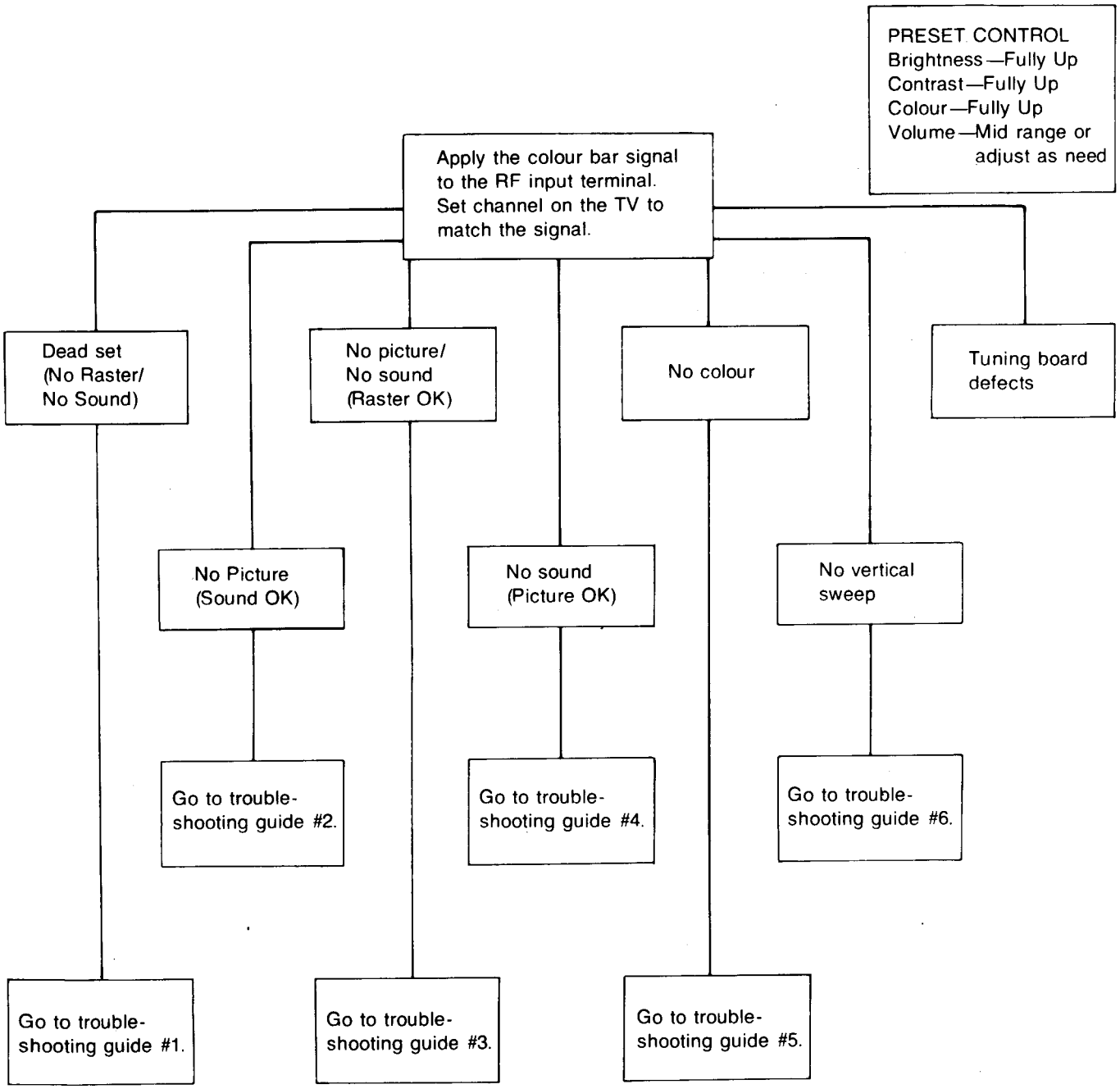
luminance signal supplied on the pin 10 is commonly only 0.5 Vp-p.

R.G.B. Data Input

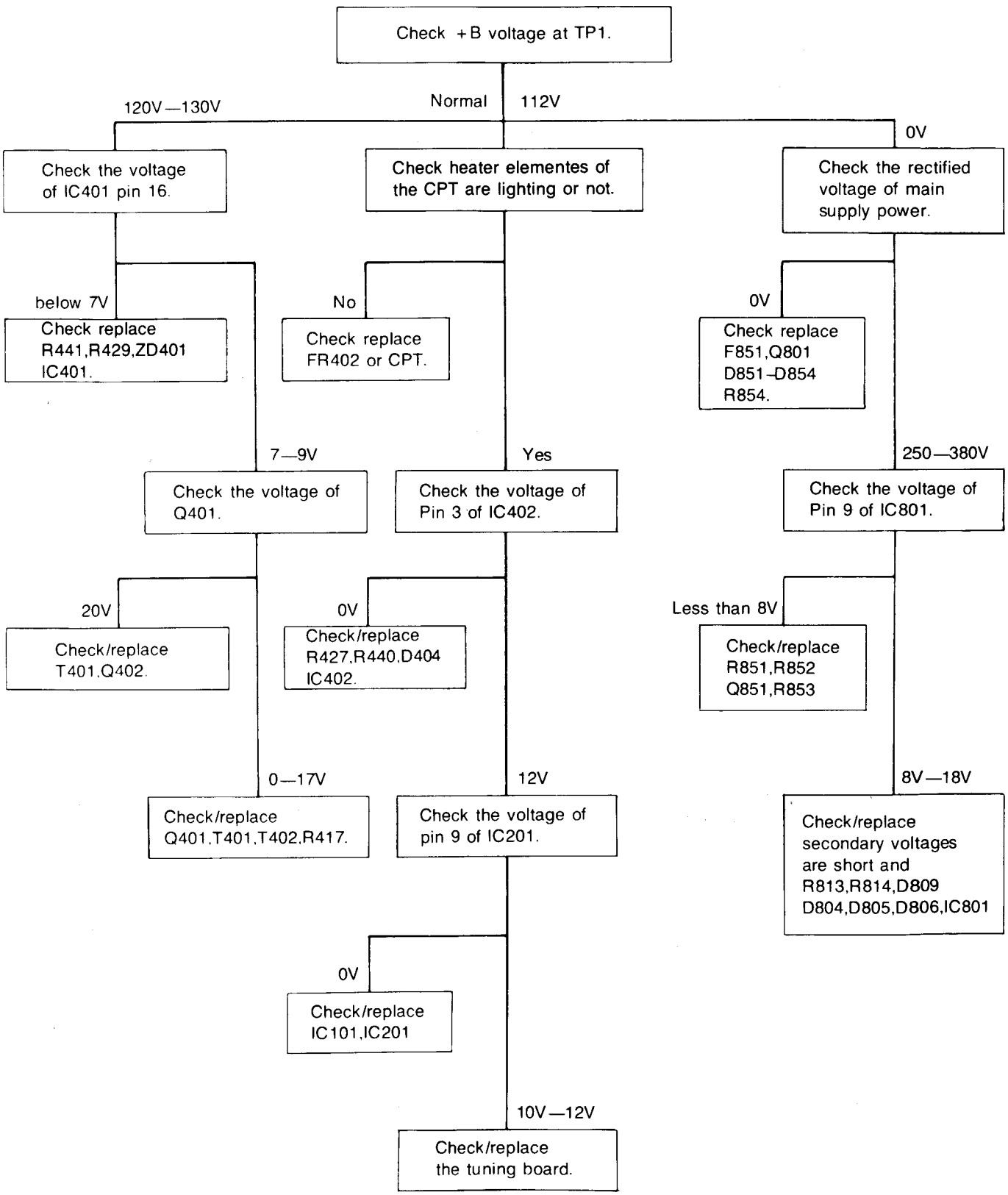
When the DC voltage of the pin 9 remains 1—3 V, IC501 is converted into it in data input and when each of R.G.B. signals flows into the pins 13, 15, 17, each signal is in output at the pins 12, 14, 16.

In case that DC voltage of the pin 9 remains less than 0.4 V, normal state remains.

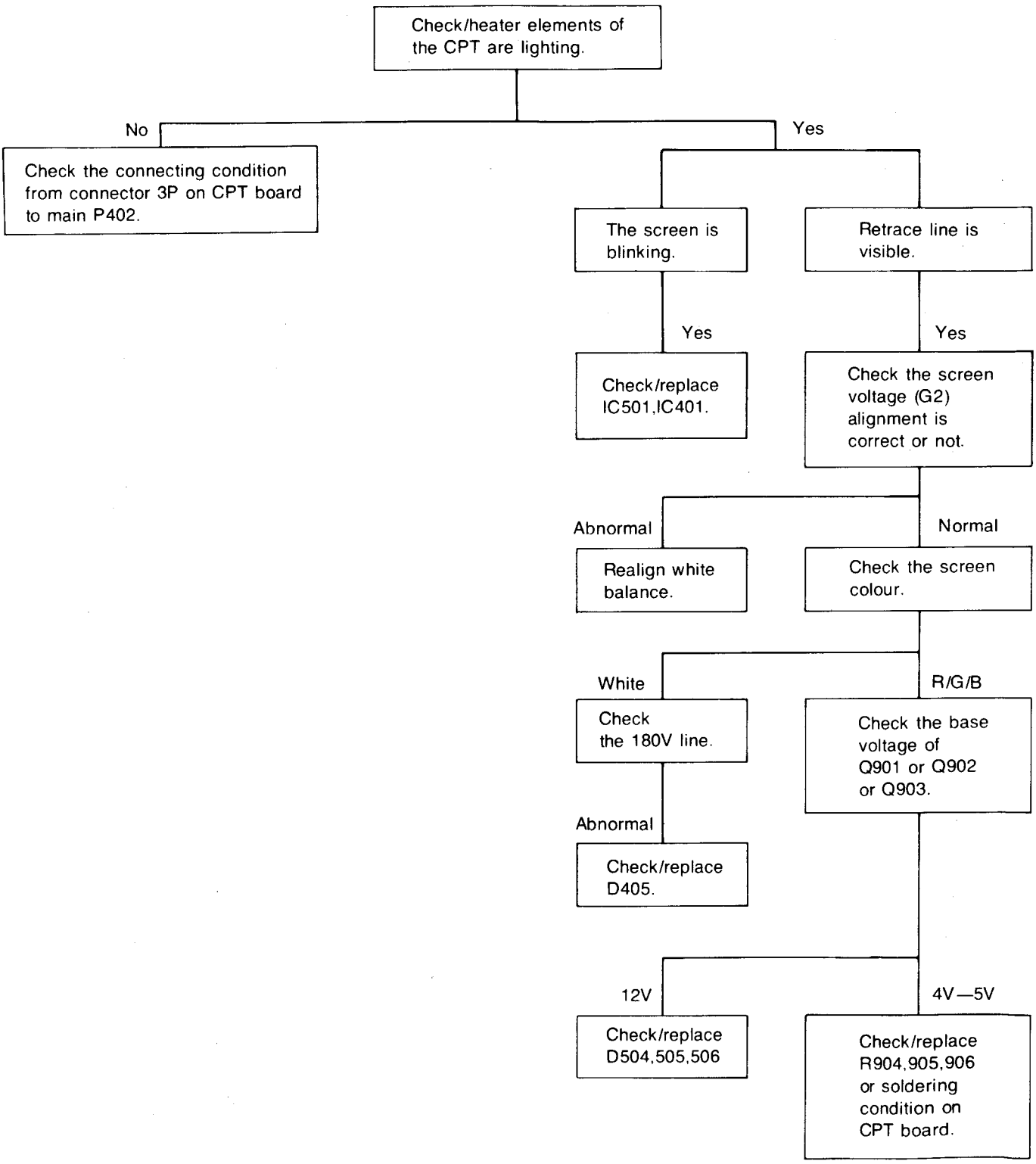
TROUBLESHOOTING GUIDE


PRESET CONTROL
Brightness—Fully Up
Contrast—Fully Up
Colour—Fully Up
Volume—Mid range or adjust as need
Apply the colour bar signal to the RF input terminal. Set channel on the TV to match the signal.
Dead set (No Raster/ No Sound)
No picture/ No sound (Raster OK)
No colour
Tuning board defects
No Picture (Sound OK)
No sound (Picture OK)
No vertical sweep
Go to trouble-shooting guide #2.
Go to trouble-shooting guide #4.
Go to trouble-shooting guide #6.
Go to trouble-shooting guide #1.
Go to trouble-shooting guide #3.
Go to trouble-shooting guide #5.

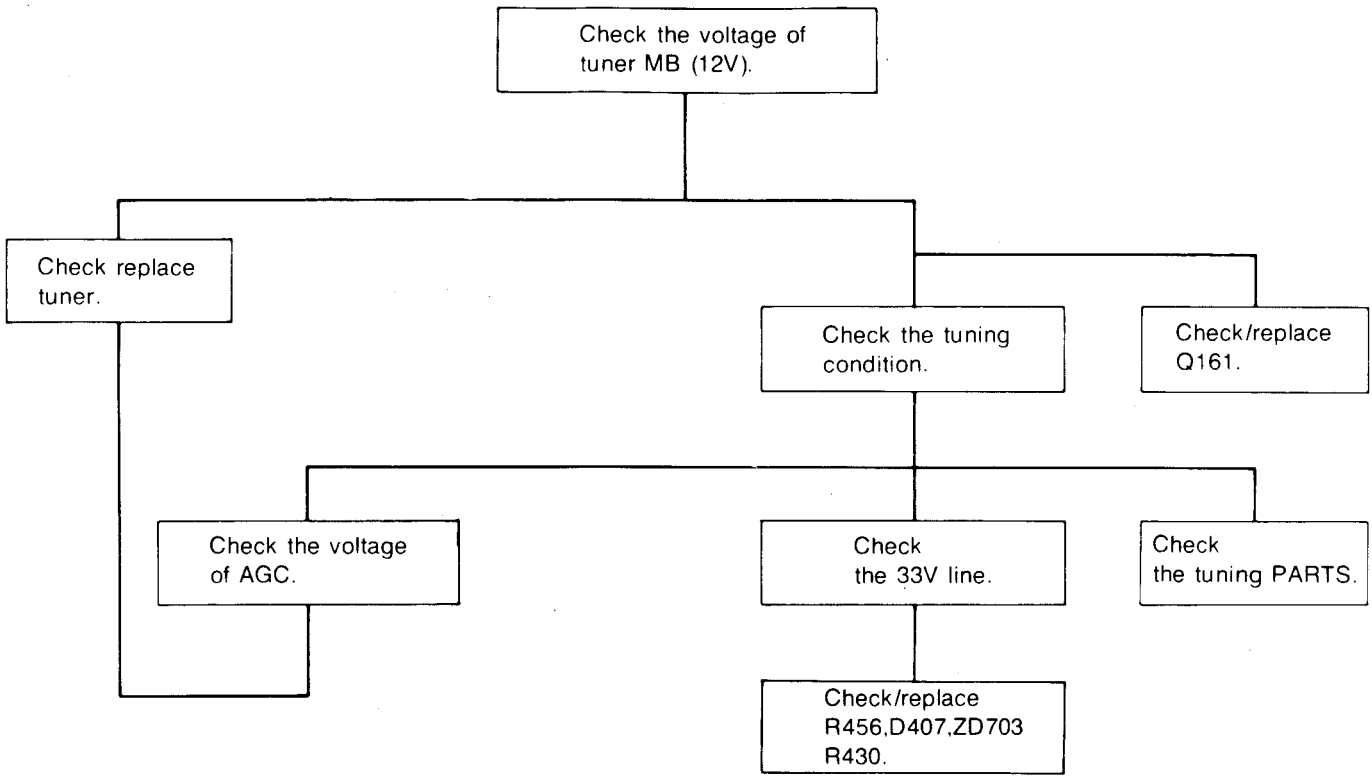
1. DEAD SET (NO RASTER/NO SOUND)



2. NO PICTURE (SOUND OK)

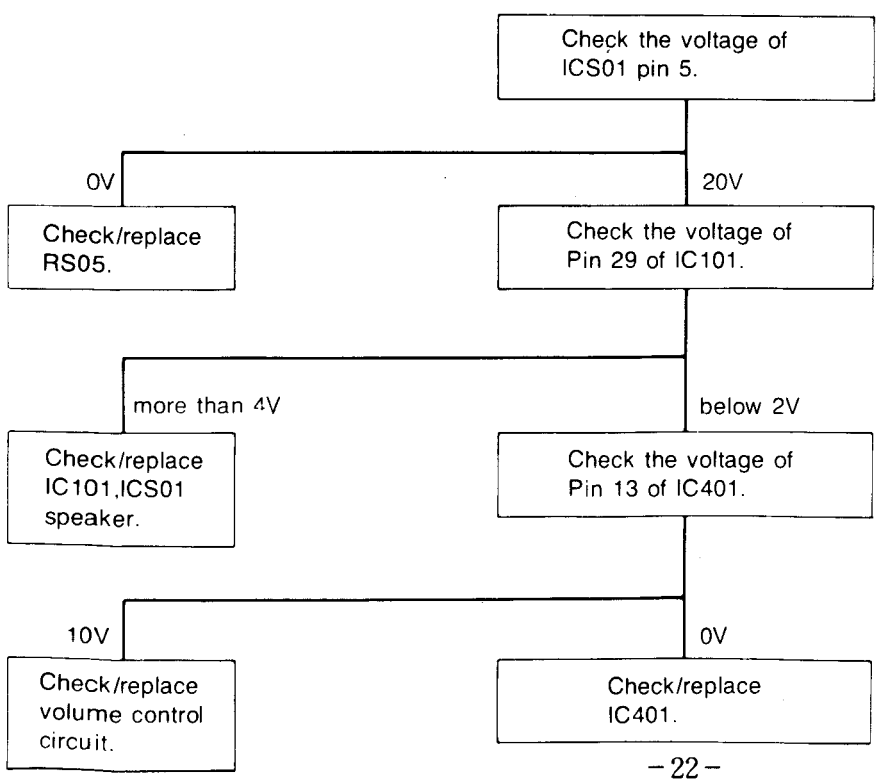


3. NO PICTURE/NO SOUND (RASTER OK WHITE NOISE ONLY)

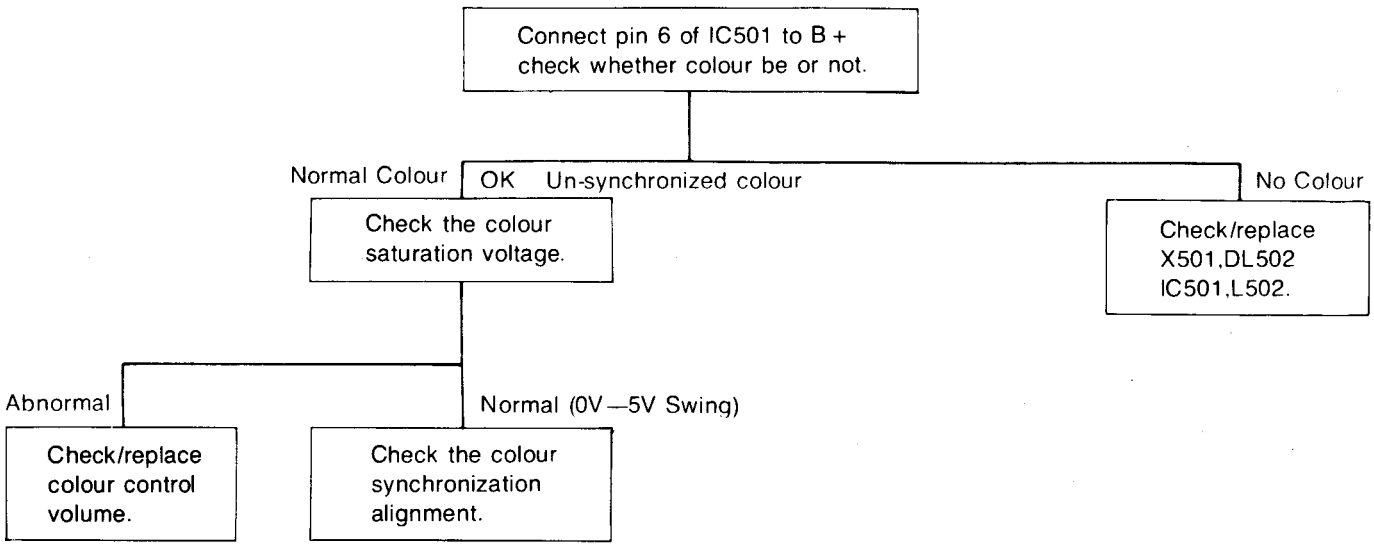

Check the voltage of tuner MB (12V).
Check replace tuner.
Check the tuning condition.
Check/replace Q161.
Check the voltage of AGC.
Check the 33V line.
Check the tuning PARTS.
Check/replace R456,D407,ZD703 R430.

4. NO SOUND (PICTURE OK)

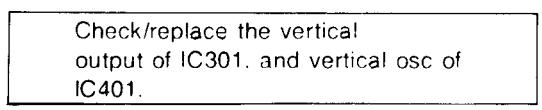
Note:
Sound is muted whenever the screen is noise condition, that is, broadcasting signal is not found.



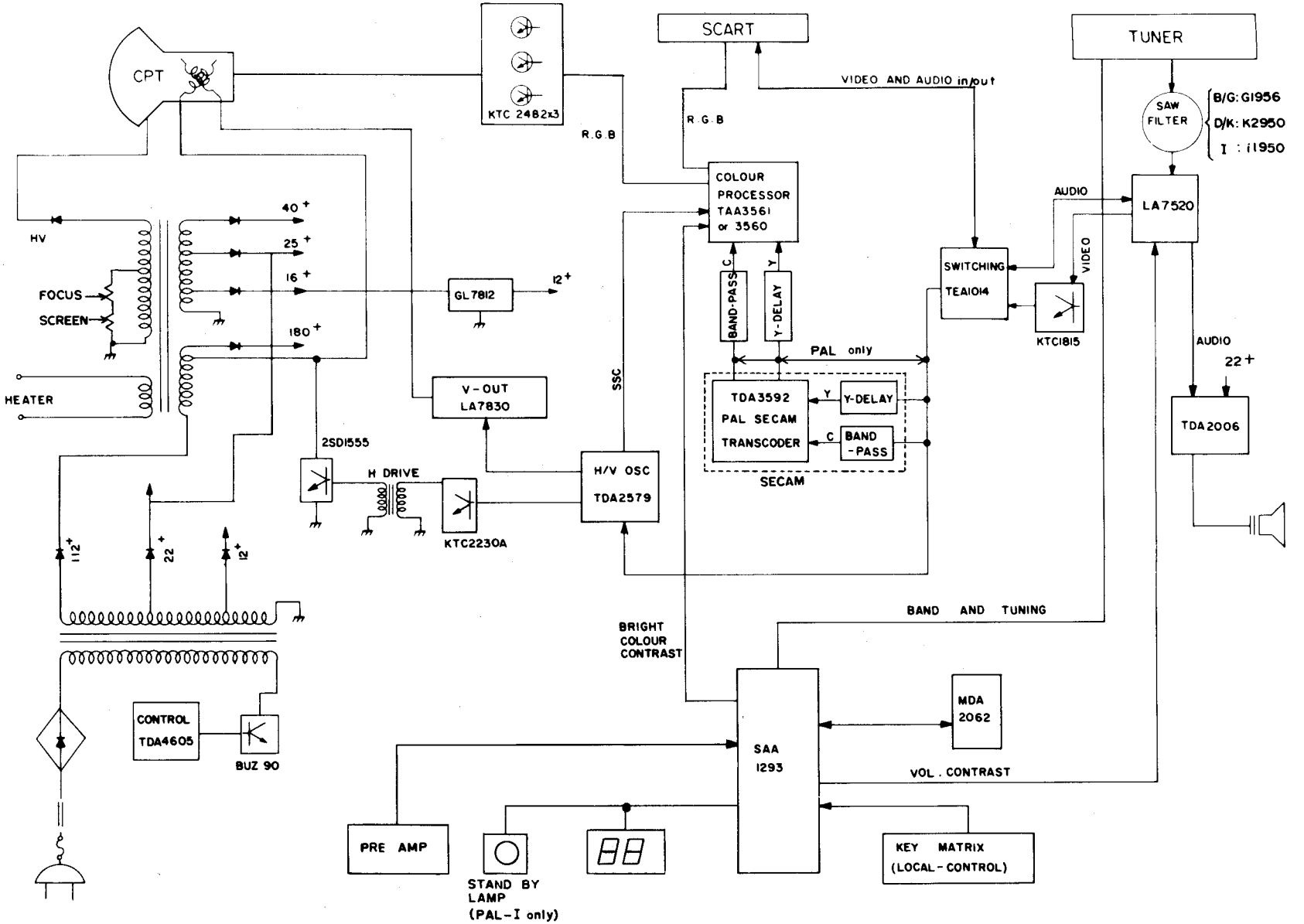
5. NO COLOUR



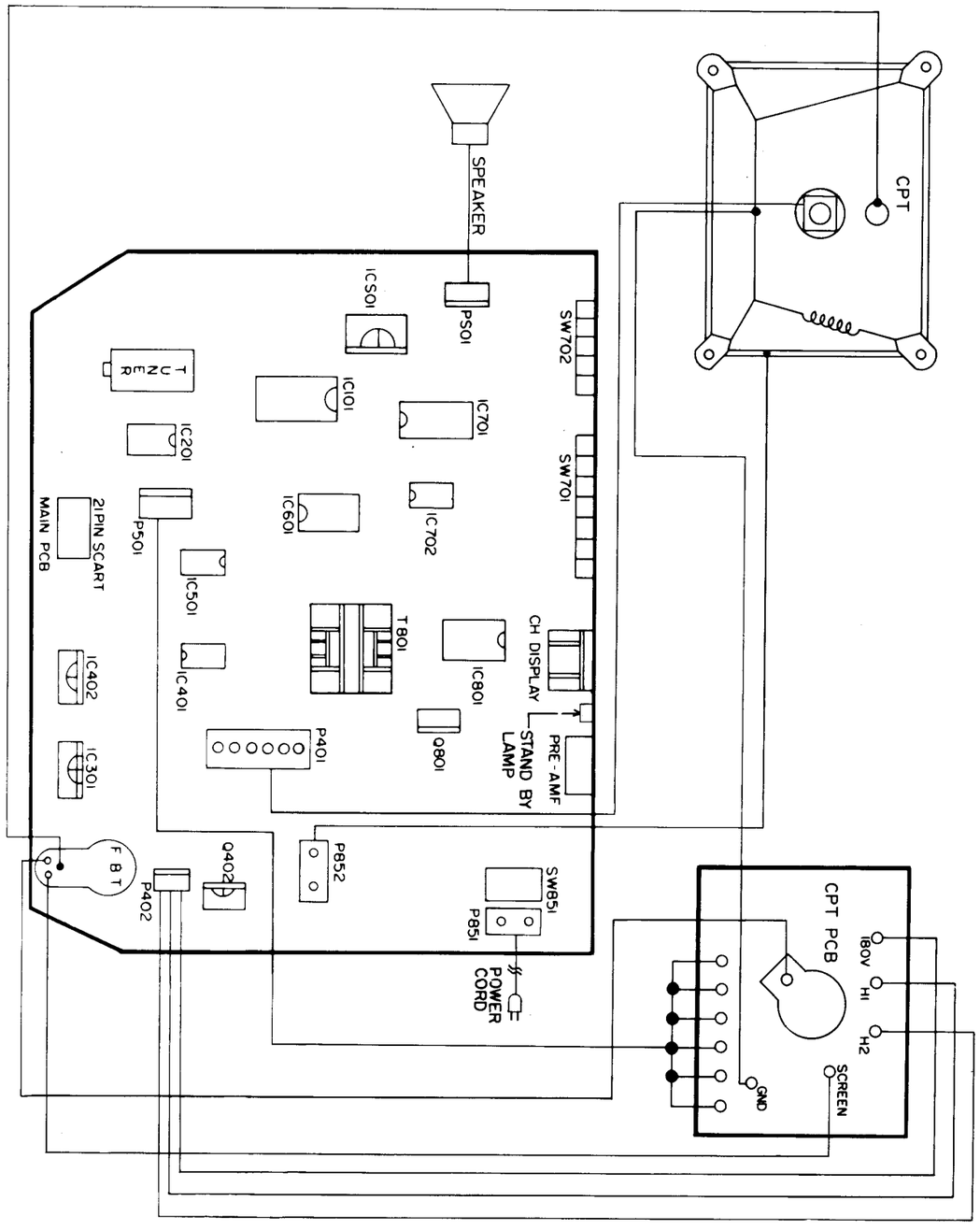
6. NO VERTICAL SWEEP



BLOCK DIAGRAM



WIRING DIAGRAM

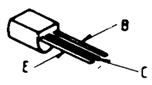
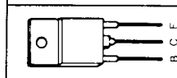
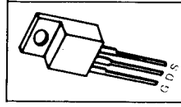


TERMINAL VIEW OF SEMICONDUCTOR

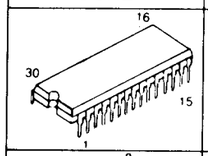
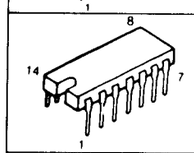
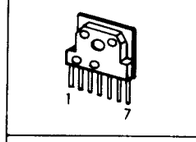
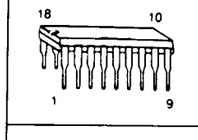
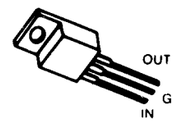
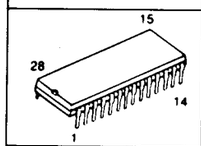
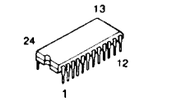
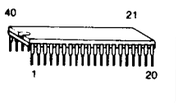
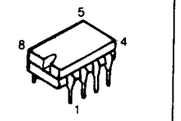
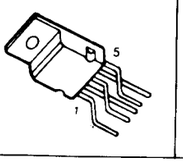
DIODE

FIGURE	DESCRIPTION	REFERENCE NO.
	1N4148TA	D101-D104 D201-D203,D204 D402,D406,D601 D703-D708,D801 D802,D901-D903
	1K34A TP-A	D701,D702,DS01
	1N4005 GP	D851,D852,D853 D854
	1N4003TA	D301,D401,D807
	TVR-06J	D403,D404,D405 D407,D803,D805 D806
	RGB15J	D804
	KA33V	ZD703
	ZENER Z9.1BMTA	ZD701
	ZENER Z20BMTA	ZD702
	ZENER Z5.6BMTA	ZD704,ZD705
	EQA02-17VB	ZD401

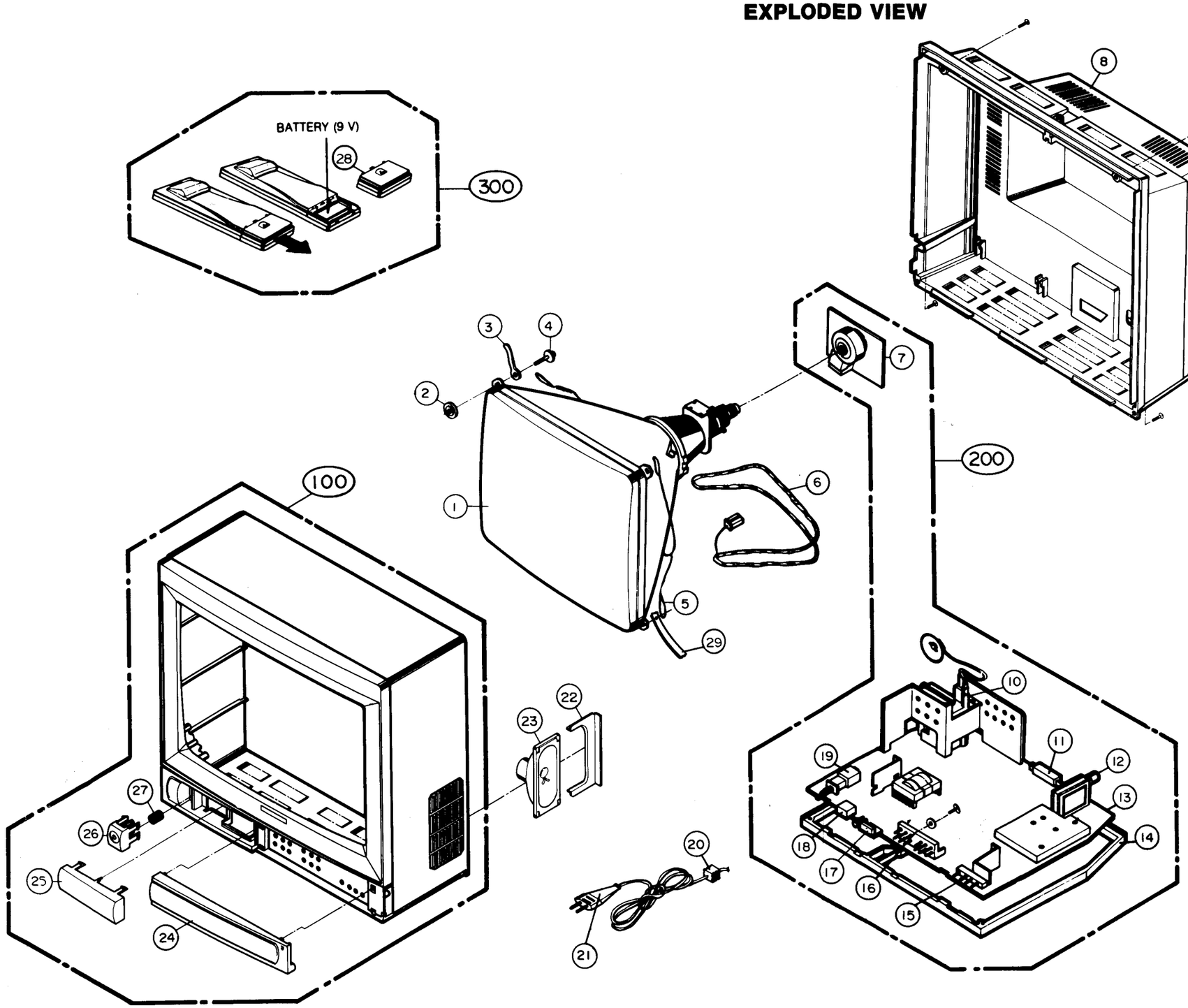
TRANSISTOR

	KTC1815-GR	Q705
	KTC2120-O	Q713
	KTC1815-O	Q101,Q102,Q201 Q151,Q152,Q701 Q707
	KTC388A	Q161
	KTA1015-O/Y	Q704,Q706 Q708-Q712
	2SD1555	Q402
	KTC2230A(Y)	Q401
	KTC2236A-O	Q714
	KTC2482	Q851,Q901-Q903
	KTC1959-Y	Q703
	SIP MOS BUZ-90	Q801

IC

FIGURE	DESCRIPTION	REFERENCE NO.
	LA7520 or GL3120	IC101
	TEA1014 MDA2062	IC201 IC702
	LA7830	IC301
	TDA2579	IC401
	GL7812	IC402
	TDA3561A	IC501
	TDA3592A	IC601
	SAA1293	IC701
	TDA4605	IC801
	TDA2006	ICS01

EXPLODED VIEW



NOTICE:
In this exploded view, some figures may differ from your actual TV a little. But each parts on the exploded view and the replacement parts list has the correct part number. Therefore, when ordering the service parts, put this service manual number, page and your requesting parts number on your document correctly, please. Then, we'll send the parts to your faster.

SP: Serviceable Parts
NSP: Not Serviceable Parts

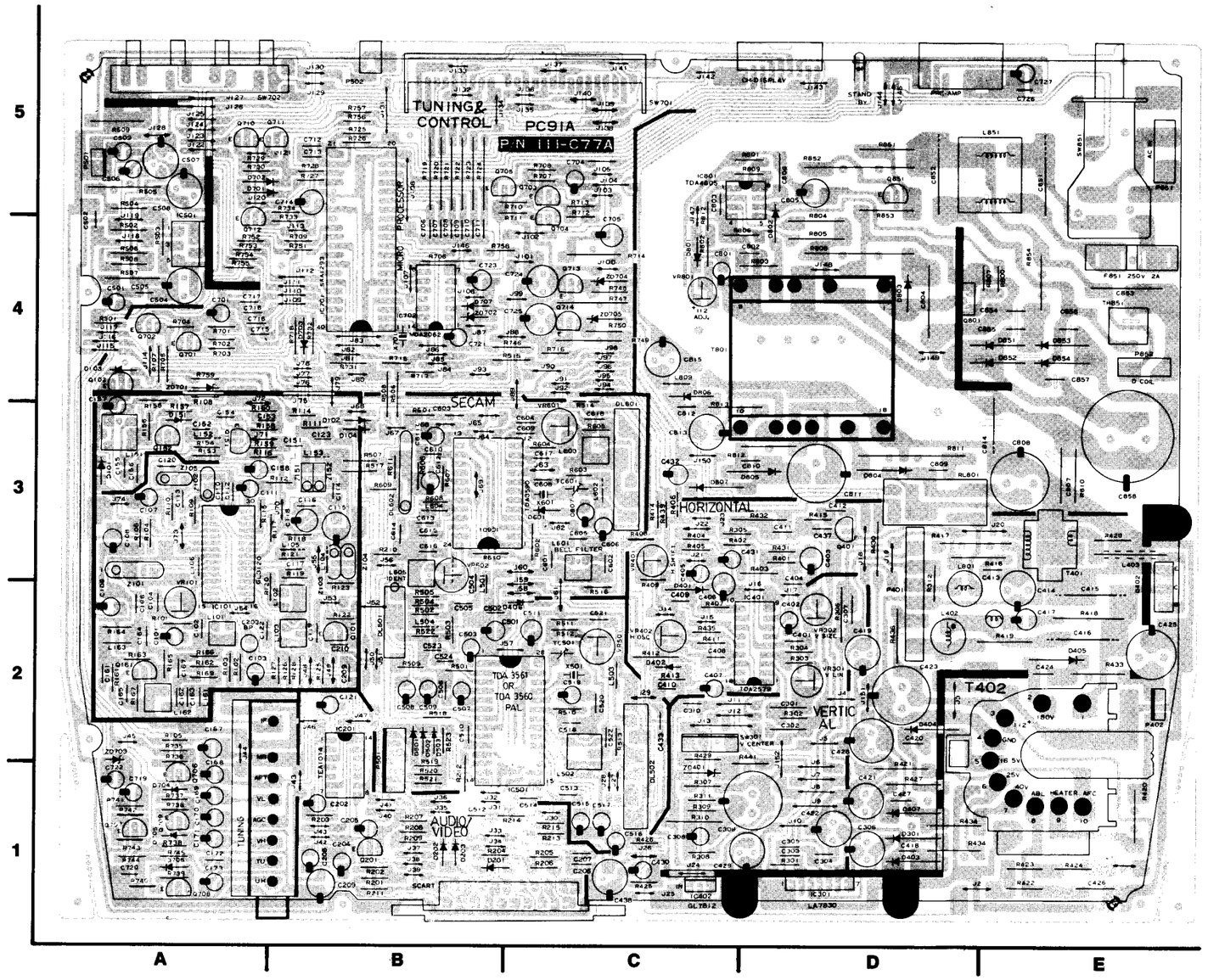
NO.	DESCRIPTION	Q'TY	PART NO.	REMARKS
1	CPT, A34KCQ12XX 02N7KE	1	2055-V0231A	SP
	DY	4	153-061A	SP
2	SEAT, RUBBER	4	327-029A	NSP
3	HOLDER, METAL ASSY	2	334-335A	SP
4	SCREW, HEXAGON HEAD	4	332-057B	SP
5	LEAD SET, EARTH	1	170-586B	NSP
6	COIL, DEGAUSSING	1	150-276F	SP
7	PCB ASSY, CPT	1	110-A31P	SP
8	COVER ASSY, CPT	1	303-D73G	SP
9	SCREW, TTS +4 ×16	4	03232305	SP
10	FBT	1	154-177B	SP
11	21 PIN PERI-SOCKET	1	381-090A	SP
12	TUNER	1	113-105K	SP
13	PCB ASSY, MAIN	1	110-K32B	SP
14	FRAME, MAIN	1	312-258A	NSP
15	SWITCH TACK, 4P	1	140-219A	SP
16	SWITCH, 12 KEY	1	140-277A	SP
17	LED DISPLAY ASSY	1	262-006A	SP
18	PRE AMP	1	106-042A	SP
19	SWITCH, MAIN	1	140-278A	SP
20	HOLDER, POWER CORD	1	341-242F	SP
21	CORD, POWER	1	174-179A	SP
22	SUPPORTER, SPEAKER	1	343-823A	NSP
23	SPEAKER	1	120-089G	SP
24	DOOR, CONTROL	1	315-442A	SP
25	WINDOW, DISPLAY	1	316-244C	SP
26	BUTTON, POWER	1	441-149A	SP
27	SPRING COIL	1	320-062G	SP
28	BATTERY COVER, REMOTE CONTROL	1	303-C58B	SP
29	HOLDER, LEAD WIRE	2	341-409H	SP

SUB ASSY

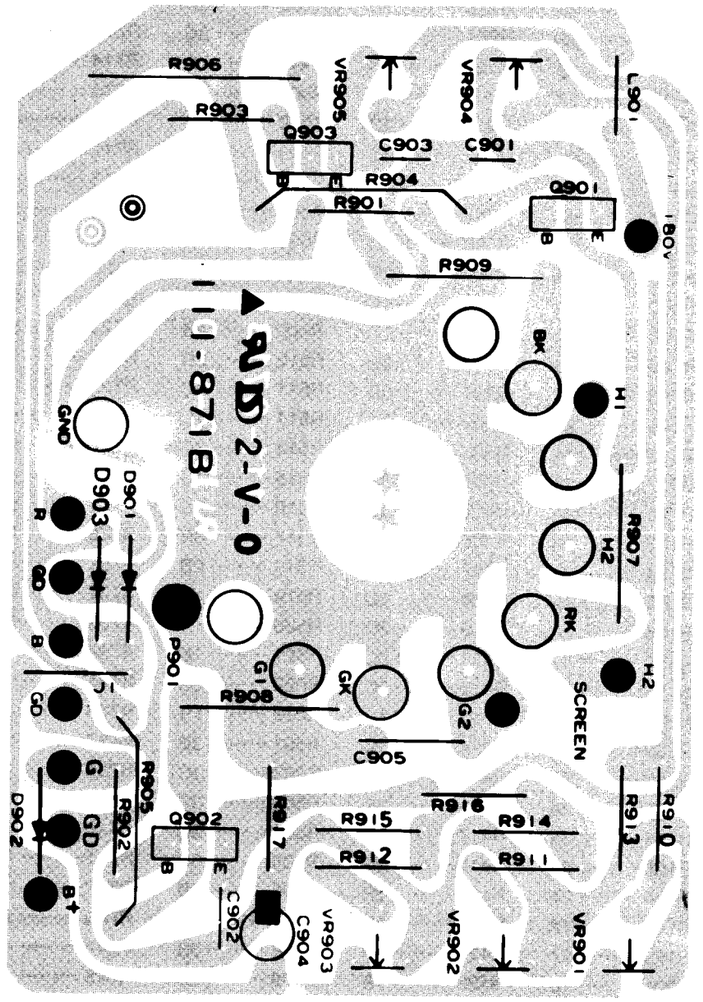
100	CABINET ASSY, FRONT	1	300-855C	SP
200	CABINET ASSY, MAIN	1	309-741B	SP
300	REMOTE CONTROL ASSY	1	105-057C	SP

PRINTED CIRCUIT BOARD

MAIN P.C. Board(Component Side)



CPT P.C. Board (Component Side)



COMPONENT LOCATION GUIDE

(Refer to page 29)

R101 ····· 2A
R102 ····· 2A
R103 ····· 2A
R104 ····· 3A
R105 ····· 1A
R106 ····· 3A
R107 ····· 4A
R108 ····· 3A
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R111 ····· 3B
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RS07 ····· 4A
RS08 ····· 4A
RS09 ····· 5A
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VR302 ····· 2D
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VR402 ····· 2C
VR501 ····· 2C
VR601 ····· 3C
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T402 ····· 1E
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D102 ····· 3B
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D203 ····· 1B
D301 ····· 1D
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D402 ····· 2C
D403 ····· 1D
D404 ····· 2D
D405 ····· 2E
D406 ····· 2B
D407 ····· 1D
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D502 ····· 1B
D503 ····· 1B
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D702 ····· 5A
D703 ····· 4A
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D705 ····· 1A
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D852 ····· 4E
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D854 ····· 4E
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ZD701 ····· 4A
ZD702 ····· 4B
ZD703 ····· 1A
ZD705 ····· 4C
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Q102 ····· 4A
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Q851 ····· 5D
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IC201 ····· 1B
IC301 ····· 1D
IC401 ····· 2D
IC402 ····· 1C
IC501 ····· 1B
IC601 ····· 3B
IC701 ····· 4B
IC702 ····· 4B
IC801 ····· 5C
ICS01 ····· 4A
SW301 ····· 1C
SW701 ····· 5C
SW702 ····· 5A
SW851 ····· 5E
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X601 ····· 3C
X701 ····· 4B
TH851 ····· 4E
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Z102 ····· 3A
Z103 ····· 2B
Z104 ····· 2B
Z105 ····· 3A
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Z152 ····· 3B
P401 ····· 2D
P402 ····· 2E
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P851 ····· 5E
P852 ····· 4E
PS01 ····· 5A
PS02 ····· 5B
RL801 ····· 3D
SCART ····· 1B
SOCKET ·····
F851 ····· 4F

[REPLACEMENT PARTS LIST] PAGE : 1

MODEL : BUYER NAME : RUN-DATE : 90.06.01

CAUTION : 1. Before replacing any of these components, read carefully the "SAFETY PRECAUTIONS" on page 3. Do not degrade the safety of the receiver through improper servicing.

2. When ordering the service parts, put this service manual NO., page and your requesting parts NO. no your document correctly, please. Then, we'll send the parts to you faster.

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
			01157153	R,CARBON FILM	220K-J 1/8W	
			150-276F	COIL	DEGAUSSING,14",42T(D)	
			300-855C	CABINET ASSY	ASSY(SHIVAKI)	
			06300732	IC	SAA1250 (ITT,TRANSMITTER)	
			332-036C	SCREW	WASHER (M3X12)	
			03281004	SCREW.	RTS1+3X12 MSWR FZMY-1	
			06300391	IC	TDA2320	
			450-A01A	ADAPTER	ANTENNA	
			312-258A	FRAME	MAIN CHASSIS (PC91A)	
			315-442A	DOOR	ASSY,CONTROL(CBT-4825)	
			320-062G	SPRING	KNOB	
			332-057B	SCREW ASSY	HEXAGON HEAD	
			341-335A	HOLDER	METAL ASSY	
			381-090A	SOCKET ASSY	21PIN PERI-SOCKET	
			174-179A	CORD	POWER FOR FTZ(KUK JE)	
			303-C58B	COVER	BATTERY(T-22,9V)	
			381-094C	SOCKET	PCS-624	
			305-002D	HOUSING	2P AMP 171157-1 (10)	
			113-105K	TUNER	CER1A-707B(ALPS),PAL B/G	
			309-741B	CHASSIS ASSY	PC-91A CKT-4742/45	
⚠			153-061A	DY	14-PL P1	
			489-525F	KIT PRINTING	CKT-4825 TPSRA	
			371-727A	PACKING	TOP.(CBT-4822/25)	
			105-057C	TRANSMITTER ASSY	(39VS,SHIVAKI)	
			366-036A	PIN	STAPLE	
			316-244C	WINDOW	CH.DISPLAY(CKT-4825,SHIVAKI)	
			132-204A	ANTENNA ASSY	ROD(3 SECT.,F/L 400)	
			106-042A	PRE-AMP	ITT VS (SAA 1293)	
			174-171A	CORD ASSY,	POWER (PC91A)	
			341-242F	HOLDER	POWER CORD	
			441-149A	BUTTON	POWER	
⚠			2055-V0231A	CPT	A34KCQ12XX 02N7KE	
			03232303	SCREW.	TTS1+4X12 MSWR FZMY-1	
			371-728A	PACKING	BOTTOM,(CBT-4822/25)	
			343-823A	SUPPORTER	SPK	
			341-409H	HOLDER	LEAD WIRE	
			120-C26D	SPEAKER ASSY,	CBT-4742	
			372-J67C	BOX	INNER CKT-4825 TPSRA	
			303-D73G	COVER	ASSY,BACK(NEW ALPS TUNER)	
			110-K32B	PCB ASSY	MAIN (PC91A CKT-4742/45)	
			120-089G	SPEAKER	C091A06K1452	
			407-G88A	PLATE	CONTROL DECORATION(4822)	
			110-A31P	PWB ASSY	CPT PC09X2 19"(ONE BOARD)	
		CS01	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		CS02	08700331	C,POLYESTER	0.01MF/100V K	
		CS03	08110313	C,ELECTROLYTIC	10MF/16V Y	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		CS04	181-081B	C,ELECTROLYTIC	220MF/35V	
		CS05	08700337	C,POLYESTER	0.1MF/100V K	
		CS06	08110313	C,ELECTROLYTIC	10MF/16V Y	
		CS07	02140323	C,ELECTROLYTIC	470MF/16V Y	
		CS08	181-081B	C,ELECTROLYTIC	220MF/35V	
		CS09	08110316	C,ELECTROLYTIC	33MF/16V M	
		C101	08110505	C,ELECTROLYTIC	0.47MF/50V Y	
		C102	08300112	C,CERAMIC(TC)	10PF/50V D	
		C104	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C106	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C107	08705336	C,POLYESTER	0.068MF/100V K	
		C108	08110313	C,ELECTROLYTIC	10MF/16V Y	
		C109	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		C110	08300724	C,CERAMIC(TC)	33PF/50V J	
		C111	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		C112	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C113	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C114	08300736	C,CERAMIC(TC)	100PF/50V J	
		C115	08110319	C,ELECTROLYTIC	100MF/16V Y	
		C116	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C117	08300116	C,CERAMIC(TC)	15PF/50V J	
		C119	08110507	C,ELECTROLYTIC	1MF/50V Y	
		C120	08300728	C,CERAMIC(TC)	47PF/50V J	
		C121	08110316	C,ELECTROLYTIC	33MF/16V M	
		C123	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C151	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C152	02200740	C,CERAMIC(HI-K)	150PF/50V K	
		C153	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C154	08300718	C,CERAMIC(TC)	18PF/50V J	
		C155	02300146	C,CERAMIC(TC)	270PF/50V J	
		C156	08300149	CAPACITOR.CC,TAPING	CC45SL1H361JYTR	
		C157	08110313	C,ELECTROLYTIC	10MF/16V Y	
		C158	08110507	C,ELECTROLYTIC	1MF/50V Y	
		C161	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C166	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C167	08110319	C,ELECTROLYTIC	100MF/16V Y	
		C168	08110505	C,ELECTROLYTIC	0.47MF/50V Y	
		C169	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		C170	08110313	C,ELECTROLYTIC	10MF/16V Y	
		C171	08110313	C,ELECTROLYTIC	10MF/16V Y	
		C172	0870243A	C,POLYESTER	0.033MF/100V	
		C173	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		C174	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C202	08110313	C,ELECTROLYTIC	10MF/16V Y	
		C203	181-064N	C,ELECTROLYTIC	4.7MF/16V	
		C204	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		C205	08110511	C,ELECTROLYTIC	4.7MF/50V Y	
		C206	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C207	08700337	C,POLYESTER	0.1MF/100V K	
		C208	08110313	C,ELECTROLYTIC	10MF/16V Y	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION		REMARKS
		C209	08200972	C,CERAMIC(HI-K)	0.01MF/50V	Z	
		C211	08200974	C,CERAMIC(HI-K)	0.047MF/50V	Z	
		C301	181-155A	C,METAL POLYPROPYLENE	0.22MF/100V	J	
		C302	181-155B	C,METAL POLYPROPYLENE	0.33MF/100V	J	
		C303	08300154	C,CERAMIC(TC)	560PF/50V	J	
		C304	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C305	08300730	C,CERAMIC(TC)	56PF/50V	J	
		C306	08110419	C,ELECTROLYTIC	100MF/25V	Y	
		C307	08700337	C,POLYESTER	0.1MF/100V	K	
		C308	08110507	C,ELECTROLYTIC	1MF/50V	Y	
		C309	02140427	C,ELECTROLYTIC	0.0022MF/25V	Y	
		C310	08700331	C,POLYESTER	0.01MF/100V	K	
		C315	08700331	C,POLYESTER	0.01MF/100V	K	
		C401	08300144	C,CERAMIC(TC)	220PF/50V	J	
		C402	08110509	C,ELECTROLYTIC	2.2MF/50V	Y	
		C403	08110315	C,ELECTROLYTIC	22MF/16V	M	
		C404	08700337	C,POLYESTER	0.1MF/100V	K	
		C405	08110511	C,ELECTROLYTIC	4.7MF/50V	Y	
		C406	08110317	C,ELECTROLYTIC	47MF/16V	Y	
		C407	08110316	C,ELECTROLYTIC	33MF/16V	M	
		C408	181-074N	CAPACITOR PSR	2700PF/50V	J	
		C409	08700337	C,POLYESTER	0.1MF/100V	K	
		C410	08700337	C,POLYESTER	0.1MF/100V	K	
		C411	08700337	C,POLYESTER	0.1MF/100V	K	
		C412	08200748	C,CERAMIC(HI-K)	330PF/50V	K	
		C413	08705336	C,POLYESTER	0.068MF/100V	K	
		C414	08700337	C,POLYESTER	0.1MF/100V	K	
		C415	181-131D	C,METAL POLYPROPYLENE	0.01MF/1.6KV	J	
⚠		C416	181-128C	C,METAL POLYPROPYLENE	0.39MF/200V	J	
		C417	08110707	C,ELECTROLYTIC	1MF/160V	M	
		C418	08201046	C,CERAMIC(HI-K)	270PF/500V	K	
		C419	181-081B	C,ELECTROLYTIC	220MF/35V		
		C420	08201046	C,CERAMIC(HI-K)	270PF/500V	K	
		C421	02140422	C,ELECTROLYTIC	330MF/25V	M	
		C422	181-081B	C,ELECTROLYTIC	220MF/35V		
⚠		C423	02140719	C,ELECTROLYTIC	100MF/160V	Y	
		C424	08201046	C,CERAMIC(HI-K)	270PF/500V	K	
		C425	02140811	C,ELECTROLYTIC	4.7MF/250V	Y	
		C426	181-059D	C,POLYPROYLENE	0.047MF/200V	K	
		C427	08201046	C,CERAMIC(HI-K)	270PF/500V	K	
		C428	08110518	C,ELECTROLYTIC	47MF/50V	Y	
		C429	02140321	C,ELECTROLYTIC	220MF/16V	Y	
		C431	08110313	C,ELECTROLYTIC	10MF/16V	Y	
		C432	08110511	C,ELECTROLYTIC	4.7MF/50V	Y	
		C433	08300146	C,CERAMIC(TC)	270PF/50V	J	
		C437	08200748	C,CERAMIC(HI-K)	330PF/50V	K	
		C438	02140321	C,ELECTROLYTIC	220MF/16V	Y	
		C501	08110317	C,ELECTROLYTIC	47MF/16V	Y	
		C502	08200972	C,CERAMIC(HI-K)	0.01MF/50V	Z	
		C503	08110505	C,ELECTROLYTIC	0.47MF/50V	Y	
		C504	08300740	C,CERAMIC(TC)	150PF/50V	J	

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		C505	08300730	C,CERAMIC(TC)	56PF/50V	J	
		C506	08700337	C,POLYESTER	0.1MF/100V	K	
		C507	08110509	C,ELECTROLYTIC	2.2MF/50V	Y	
		C508	08110315	C,ELECTROLYTIC	22MF/16V	M	
		C509	08110313	C,ELECTROLYTIC	10MF/16V	Y	
		C510	08700337	C,POLYESTER	0.1MF/100V	K	
		C511	08110313	C,ELECTROLYTIC	10MF/16V	Y	
		C512	08700337	C,POLYESTER	0.1MF/100V	K	
		C513	08700337	C,POLYESTER	0.1MF/100V	K	
		C514	08700337	C,POLYESTER	0.1MF/100V	K	
		C515	08110507	C,ELECTROLYTIC	1MF/50V	Y	
		C516	08110507	C,ELECTROLYTIC	1MF/50V	Y	
		C517	08110507	C,ELECTROLYTIC	1MF/50V	Y	
		C518	08700337	C,POLYESTER	0.1MF/100V	K	
		C519	08110509	C,ELECTROLYTIC	2.2MF/50V	Y	
		C520	08700337	C,POLYESTER	0.1MF/100V	K	
		C521	08200972	C,CERAMIC(HI-K)	0.01MF/50V	Z	
		C522	08700331	C,POLYESTER	0.01MF/100V	K	
		C523	08300736	C,CERAMIC(TC)	100PF/50V	J	
		C524	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C601	08700337	C,POLYESTER	0.1MF/100V	K	
		C602	08700337	C,POLYESTER	0.1MF/100V	K	
		C603	08300728	C,CERAMIC(TC)	47PF/50V	J	
		C604	08300732	C,CERAMIC(TC)	68PF/50V	J	
		C605	08700337	C,POLYESTER	0.1MF/100V	K	
		C606	08110501	C,ELECTROLYTIC	0.1MF/50V	M	
		C607	08110313	C,ELECTROLYTIC	10MF/16V	Y	
		C608	08700331	C,POLYESTER	0.01MF/100V	K	
		C609	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C610	08110511	C,ELECTROLYTIC	4.7MF/50V	Y	
		C611	08110315	C,ELECTROLYTIC	22MF/16V	M	
		C612	08110507	C,ELECTROLYTIC	1MF/50V	Y	
		C613	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C614	08300734	C,CERAMIC(TC)	82PF/50V	J	
		C615	08700337	C,POLYESTER	0.1MF/100V	K	
		C616	08700337	C,POLYESTER	0.1MF/100V	K	
		C617	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C618	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C620	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C701	08110501	C,ELECTROLYTIC	0.1MF/50V	M	
		C704	08110313	C,ELECTROLYTIC	10MF/16V	Y	
		C706	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C707	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C708	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C709	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C710	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C711	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C712	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C713	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	
		C714	08110317	C,ELECTROLYTIC	47MF/16V	Y	
		C715	08200760	C,CERAMIC(HI-K)	1000PF/50V	Y	

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		C716	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C717	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C718	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C719	08110507	C,ELECTROLYTIC	1MF/50V Y	
		C720	08700337	C,POLYESTER	0.1MF/100V K	
		C721	08110507	C,ELECTROLYTIC	1MF/50V Y	
		C722	08110507	C,ELECTROLYTIC	1MF/50V Y	
		C723	08110315	C,ELECTROLYTIC	22MF/16V M	
		C725	08110319	C,ELECTROLYTIC	100MF/16V Y	
		C726	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C727	08110317	C,ELECTROLYTIC	47MF/16V Y	
		C730	08200972	C,CERAMIC(HI-K)	0.01MF/50V Z	
		C738	08110316	C,ELECTROLYTIC	33MF/16V M	
		C739	02300147	C,CERAMIC(TC)	300PF/50V J	
		C740	08110313	C,ELECTROLYTIC	10MF/16V Y	
		C801	08110507	C,ELECTROLYTIC	1MF/50V Y	
		C802	08200760	C,CERAMIC(HI-K)	1000PF/50V Y	
		C803	181-057Q	C,ELECTROLYTIC	0.0082MF/100V J	
		C804	181-415H	CAPACITOR	BOX MPF 630V 0.033MF	
		C805	08110317	C,ELECTROLYTIC	47MF/16V Y	
		C806	08700337	C,POLYESTER	0.1MF/100V K	
		C807	181-157B	CAPACITOR	DE1410 E222M	
⚠		C808	02140719	C,ELECTROLYTIC	100MF/160V Y	
		C809	08201046	C,CERAMIC(HI-K)	270PF/500V K	
		C810	08201046	C,CERAMIC(HI-K)	270PF/500V K	
⚠		C811	181-081C	C,ELECTROLYTIC	1000MF/35V	
		C812	08201046	C,CERAMIC(HI-K)	270PF/500V K	
⚠		C813	02140323	C,ELECTROLYTIC	470MF/16V Y	
		C814	181-410A	CAPACITOR	ECK-DNS472MEX	
⚠		C815	08110319	C,ELECTROLYTIC	100MF/16V Y	
		C821	02201558	C,CERAMIC(HI-K)	820PF/2KV K	
		C851	181-408C	CAPACITOR	0.47MF/250V(ISKRA)	
		C852	181-408B	CAPACITOR	0.15UF(ISKRA1531)	
		C854	08201060	C,CERAMIC(HI-K)	0.001MF/500V K	
		C855	08201060	C,CERAMIC(HI-K)	0.001MF/500V K	
		C856	08201060	C,CERAMIC(HI-K)	0.001MF/500V K	
		C857	08201060	C,CERAMIC(HI-K)	0.001MF/500V K	
⚠		C858	181-124B	C,ELECTROLYTIC	200MF/400V	
		C860	181-093A	CAPACITOR	CERA DE7090102K 125V	
		C870	02110421	C,ELECTROLYTIC	220MF/25V Y	
		C901	02300147	C,CERAMIC(TC)	300PF/50V J	
		C902	02300146	C,CERAMIC(TC)	270PF/50V J	
		C903	02300146	C,CERAMIC(TC)	270PF/50V J	
		C904	08110317	C,ELECTROLYTIC	47MF/16V Y	
		C905	02201561	C,CERAMIC(HI-K)	1200PF/2KV K	
		DS01	06200235	DIODE	1K34A TP-A	
		DL501	150-377G	DELAY LINE COIL	(350N)	
		DL502	175-013A	DELAY LINE	1H SD-11 P1D	
		DL601	175-013A	DELAY LINE	1H SD-11 P1D	
		DL602	150-377F	COIL	Y-DELAY LINE(380N)	
		D101	06200226	DIODE	1N4148 (DS4148) TA.	

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		D102	06200226	DIODE	1N4148 (DS4148) TA.	
		D103	06200226	DIODE	1N4148 (DS4148) TA.	
		D104	06200226	DIODE	1N4148 (DS4148) TA.	
		D151	06200226	DIODE	1N4148 (DS4148) TA.	
		D201	06200226	DIODE	1N4148 (DS4148) TA.	
		D202	06200226	DIODE	1N4148 (DS4148) TA.	
		D203	06200226	DIODE	1N4148 (DS4148) TA.	
		D204	06200226	DIODE	1N4148 (DS4148) TA.	
		D301	06220070	DIODE	1N4003TA	
		D401	06220070	DIODE	1N4003TA	
		D402	06200226	DIODE	1N4148 (DS4148) TA.	
		D403	06200363	DIODE	TVR-06J	
		D404	06200363	DIODE	TVR-06J	
		D405	06200363	DIODE	TVR-06J	
		D406	06200226	DIODE	1N4148 (DS4148) TA.	
		D407	06200363	DIODE	TVR-06J	
		D601	06200226	DIODE	1N4148 (DS4148) TA.	
		D700	06200226	DIODE	1N4148 (DS4148) TA.	
		D702	06200235	DIODE	1K34A TP-A	
		D703	06200226	DIODE	1N4148 (DS4148) TA.	
		D704	06200226	DIODE	1N4148 (DS4148) TA.	
		D705	06200226	DIODE	1N4148 (DS4148) TA.	
		D706	06200226	DIODE	1N4148 (DS4148) TA.	
		D707	06200226	DIODE	1N4148 (DS4148) TA.	
		D708	06200226	DIODE	1N4148 (DS4148) TA.	
		D801	06200226	DIODE	1N4148 (DS4148) TA.	
		D802	06200226	DIODE	1N4148 (DS4148) TA.	
		D803	06200455	DIODE	R10J,D10DE(1A/600V)	
⚠		D804	06220202	DIODE	RGP15J	
⚠		D805	06200363	DIODE	TVR-06J	
⚠		D806	06200363	DIODE	TVR-06J	
		D807	06220070	DIODE	1N4003TA	
⚠		D851	06200124	DIODE	1N4005GP	
⚠		D852	06200124	DIODE	1N4005GP	
⚠		D853	06200124	DIODE	1N4005GP	
⚠		D854	06200124	DIODE	1N4005GP	
		D901	06200226	DIODE	1N4148 (DS4148) TA.	
		D902	06200226	DIODE	1N4148 (DS4148) TA.	
		D903	06200226	DIODE	1N4148 (DS4148) TA.	
⚠		F851	131-027A	FUSE	GLASS TUBE MINI 3.15A/250	
		ICS01	06300387	IC	TDA2006(GSS)	
		IC101	06300357	IC	LA7520	
		IC201	06300958	IC	GL3810	
		IC301	06300360	IC	LA7830	
		IC401	06300381	IC	TDA2579(VALVO)	
		IC402	06300218	IC	GL7812	
		IC501	06300493	IC	TDA3561A	
		IC601	06300492	IC	TDA3592A(SECAM TRANSCODER)	
		IC701	06300728	IC	SAA1293 (ITT VS U-COMPUTER)	
		IC702	06300729	IC	MDA2062 (ITT VS EEPROM)	
⚠		IC801	06300777	IC	SMPS TDA 4605(SIEMENS)	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		J102	01165119	R,CARBON FILM	8.2K-J 1/16W	
		LS01	04040081	PEAKING COIL	470MH-K	
		L102	150-327M	VIF COIL	(PC04X)	
		L103	150-327Q	AFT COIL	(PC04X)	
		L104	04040039	PEAKING COIL	8.2MH-K	
		L105	04040037	PEAKING COIL	6.8MH-K	
		L151	150-521A	COIL	VARIABLE OSC (TRF-3030)	
		L152	150-109Q	PEAKING COIL	5.6MH-K	
		L153	04040045	PEAKING COIL	15MH-K	
		L163	150-167D	CHOKE COIL	1.0MH	
		L401	04040109	PEAKING COIL	6800MH-K	
		L402	150-224L	LINEARITY COIL		
		L403	125-022B	CORE,FERRITE	SM-2CRHW3.5X12X1B	
		L502	150-163G	MATRIX COIL	ADJ(PC07X)	
		L503	04040043	PEAKING COIL	12MH-K	
		L504	04040053	PEAKING COIL	330HM-K	
		L601	150-489B	COIL	SECAM BELL FILTER	
		L602	04040039	PEAKING COIL	8.2MH-K	
		Z151	166-002D	FILTER	CERAMIC SFE 5.5MB	
		Z152	166-002F	FILTER	CERAMIC SFE 6.5MB	
		L603	150-489C	COIL	DELAY MATRIX ADJ.	
		L604	04040031	PEAKING COIL	3.9MH-K	
		L605	150-489D	COIL	SECAM DEM.	
		L606	01165058	R,CARBON FILM	24-J 1/16W	
		L800	150-679D	COIL	CHOKE 100UH(NAMYANG)	
		L801	150-235E	HOR.CHOKE COIL	1MH(1A)	
		L809	04040089	PEAKING COIL	1000MH-K	
⚠		L851	150-670B	COIL	LINE FILTER(70MH)	
		Q101	06120239	TRANSISTOR,	KTC1815-O(TA)	
		Q102	06120239	TRANSISTOR,	KTC1815-O(TA)	
		Q151	06120168	TRANSISTOR,	KTC1815-O	
		Q152	06120168	TRANSISTOR,	KTC1815-O	
		Q161	06120235	TRANSISTOR,	KTC388A(TA)	
		Q201	06120239	TRANSISTOR,	KTC1815-O(TA)	
		Q401	06120225	TRANSISTOR	KTC2230A(Y)	
		Q402	06130134	TRANSISTOR,	2SD 1555	
		Q701	06120239	TRANSISTOR,	KTC1815-O(TA)	
		Q702	06120239	TRANSISTOR,	KTC1815-O(TA)	
		Q703	06179461	TRANSISTOR	KTC 1959-Y (TA)	
		Q704	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q705	06120249	TRANSISTOR	KTC1815-GR(TA)	
		Q706	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q707	06120239	TRANSISTOR,	KTC1815-O(TA)	
		Q708	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q709	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q710	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q711	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q712	06120252	TRANSISTOR	KTA1015-O(TA)	
		Q713	06120173	TRANSISTOR	KTC2120-O	
		Q714	06120213	TRANSISTOR	KTC2236A-O	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
⚠		Q801	06120334	TRANSISTOR	SIP MOS BUZ-90(SIEMENS)	
		Q851	06120236	TRANSISTOR	KTC2482(TA)	
		Q901	06120220	TRANSISTOR,	KTC2068	
		Q902	06120220	TRANSISTOR,	KTC2068	
		Q903	06120220	TRANSISTOR,	KTC2068	
		RJ96	01165073	R,CARBON FILM	100-J 1/16W	
		RL801	141-018A	RELAY	DG12D1-0(M)	
		RS01	01165117	R,CARBON FILM	6.8K-J 1/16W	
		RS02	01157145	R,CARBON FILM	100K-J 1/8W	
		RS03	01157145	R,CARBON FILM	100K-J 1/8W	
		RS04	01157145	R,CARBON FILM	100K-J 1/8W	
		RS05	180-140M	R,FUSING	10-J 1W	
		RS06	01157133	R,CARBON FILM	33K-J 1/8W	
		RS07	01154025	R,CARBON FILM	1-J 1/2W	
		RS08	01157119	R,CARBON FILM	8.2K-J 1/8W	
		RS310	01154025	R,CARBON FILM	1-J 1/2W	
		R101	01165105	R,CARBON FILM	2.2K-J 1/16W	
		R102	01165097	R,CARBON FILM	1K-J 1/16W	
		R103	01165135	R,CARBON FILM	39K-J 1/16W	
		R104	01165125	R,CARBON FILM	15K-J 1/16W	
		R105	01165113	R,CARBON FILM	4.7K-J 1/16W	
		R106	01165121	R,CARBON FILM	10K-J 1/16W	
		R107	01165143	R,CARBON FILM	82K-J 1/16W	
		R108	01165121	R,CARBON FILM	10K-J 1/16W	
		R109	01165087	R,CARBON FILM	390-J 1/16W	
		R110	01165089	R,CARBON FILM	470-J 1/16W	
		R111	01165137	R,CARBON FILM	47K-J 1/16W	
		R112	01165075	R,CARBON FILM	120-J 1/16W	
		R114	01165121	R,CARBON FILM	10K-J 1/16W	
		R115	01165097	R,CARBON FILM	1K-J 1/16W	
		R116	01165073	R,CARBON FILM	100-J 1/16W	
		R117	01165067	R,CARBON FILM	56-J 1/16W	
		R118	01165105	R,CARBON FILM	2.2K-J 1/16W	
		R119	01165097	R,CARBON FILM	1K-J 1/16W	
		R120	01165103	R,CARBON FILM	1.8K-J 1/16W	
		R121	01165075	R,CARBON FILM	120-J 1/16W	
		R123	01165105	R,CARBON FILM	2.2K-J 1/16W	
		R125	01165097	R,CARBON FILM	1K-J 1/16W	
		R126	01165129	R,CARBON FILM	22K-J 1/16W	
		R127	01165131	R,CARBON FILM	27K-J 1/16W	
		R128	01165097	R,CARBON FILM	1K-J 1/16W	
		R130	01165097	R,CARBON FILM	1K-J 1/16W	
		R153	01165097	R,CARBON FILM	1K-J 1/16W	
		R154	01165115	R,CARBON FILM	5.6K-J 1/16W	
		R155	01165121	R,CARBON FILM	10K-J 1/16W	
		R156	01165128	R,CARBON FILM	20K-J 1/16W	
		R157	01165125	R,CARBON FILM	15K-J 1/16W	
		R158	01165115	R,CARBON FILM	5.6K-J 1/16W	
		R159	01165117	R,CARBON FILM	6.8K-J 1/16W	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION		REMARKS
		R160	01165104	R,CARBON FILM	2K-J	1/16W	
		R161	01165081	R,CARBON FILM	220-J	1/16W	
		R165	01165113	R,CARBON FILM	4.7K-J	1/16W	
		R166	01165097	R,CARBON FILM	1K-J	1/16W	
		R167	01165055	R,CARBON FILM	18-J	1/16W	
		R169	01165061	R,CARBON FILM	33-J	1/16W	
		R201	01165057	R,CARBON FILM	22-J	1/16W	
		R202	01165070	R,CARBON FILM	75-J	1/16W	
		R203	01165129	R,CARBON FILM	22K-J	1/16W	
		R204	01165126	R,CARBON FILM	16K-J	1/16W	
		R205	01165121	R,CARBON FILM	10K-J	1/16W	
		R206	01165121	R,CARBON FILM	10K-J	1/16W	
		R207	01165115	R,CARBON FILM	5.6K-J	1/16W	
		R208	01165113	R,CARBON FILM	4.7K-J	1/16W	
		R209	01165097	R,CARBON FILM	1K-J	1/16W	
		R210	01165093	R,CARBON FILM	680-J	1/16W	
		R211	01165070	R,CARBON FILM	75-J	1/16W	
		R212	01165087	R,CARBON FILM	390-J	1/16W	
		R213	01165070	R,CARBON FILM	75-J	1/16W	
		R214	01165070	R,CARBON FILM	75-J	1/16W	
		R215	01165070	R,CARBON FILM	75-J	1/16W	
		R216	01165103	R,CARBON FILM	1.8K-J	1/16W	
		R220	01165093	R,CARBON FILM	680-J	1/16W	
		R301	01165105	R,CARBON FILM	2.2K-J	1/16W	
		R302	01165157	R,CARBON FILM	330K-J	1/16W	
		R303	01165125	R,CARBON FILM	15K-J	1/16W	
		R304	01165153	R,CARBON FILM	220K-J	1/16W	
		R305	01165117	R,CARBON FILM	6.8K-J	1/16W	
		R306	01154085	R,CARBON FILM	330-J	1/2W	
		R307	01157099	R,CARBON FILM	1.2K-J	1/8W	
		R308	01165151	R,CARBON FILM	180K-J	1/16W	
		R309	01165125	R,CARBON FILM	15K-J	1/16W	
		R311	01165121	R,CARBON FILM	10K-J	1/16W	
		R312	01157101	R,CARBON FILM	1.5K-J	1/8W	
		R401	01165115	R,CARBON FILM	5.6K-J	1/16W	
		R402	01165090	R,CARBON FILM	510-J	1/16W	
		R403	01165095	R,CARBON FILM	820-J	1/16W	
		R404	01165161	R,CARBON FILM	470K-J	1/16W	
		R405	01165115	R,CARBON FILM	5.6K-J	1/16W	
		R406	01165121	R,CARBON FILM	10K-J	1/16W	
		R407	01165101	R,CARBON FILM	1.5K-J	1/16W	
		R408	01165145	R,CARBON FILM	100K-J	1/16W	
		R409	01165097	R,CARBON FILM	1K-J	1/16W	
		R411	01165133	R,CARBON FILM	33K-J	1/16W	
		R412	01165081	R,CARBON FILM	220-J	1/16W	
		R413	01165161	R,CARBON FILM	470K-J	1/16W	
		R414	01165147	R,CARBON FILM	120K-J	1/16W	
		R415	01165081	R,CARBON FILM	220-J	1/16W	
		R416	01154101	R,CARBON FILM	1.5K-J	1/2W	
		R417	180-140V	R,FUSING	100 OHM	1W	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION		REMARKS
		R418	01332081	R,METAL OXIDE FILM	220-J	1W	
		R419	01332099	R,METAL OXIDE FILM	1.2K-J	1W	
		R420	180-305D	R,FUSING	1.2 OHM	1W	
		R421	01154128	R,CARBON FILM	20K-J	1/2W	
		R422	01157097	R,CARBON FILM	1K-J	1/8W	
		R423	01157145	R,CARBON FILM	100K-J	1/8W	
		R424	01157137	R,CARBON FILM	47K-J	1/8W	
		R425	01165121	R,CARBON FILM	10K-J	1/16W	
		R426	01165129	R,CARBON FILM	22K-J	1/16W	
		R427	180-305G	R,FUSING	1.5 OHM	1W	
		R428	01157063	R,CARBON FILM	39-J	1/8W	
		R429	01157097	R,CARBON FILM	1K-J	1/8W	
		R430	180-286F	R,FUSING	33-J	0.5W	
		R431	01165057	R,CARBON FILM	22-J	1/16W	
		R432	01154103	R,CARBON FILM	1.8K-J	1/2W	
		R433	180-140B	R,FUSING	1.0-J	0.5W	
⚠		R434	180-140B	R,FUSING	1.0-J	0.5W	
		R435	01165137	R,CARBON FILM	47K-J	1/16W	
		R439	01165125	R,CARBON FILM	15K-J	1/16W	
		R440	01516021	RESISTOR,METAL FILM	RN14Y2HR68JTA		
		R441	01157095	R,CARBON FILM	820-J	1/8W	
⚠		R456	180-286A	R,FUSING	2.2 OHM	0.5W	
		R500	01165110	R,CARBON FILM	3.6K-J	1/16W	
		R501	01165165	R,CARBON FILM	680K-J	1/16W	
		R502	01165061	R,CARBON FILM	33-J	1/16W	
		R503	01165073	R,CARBON FILM	100-J	1/16W	
		R503	01165070	R,CARBON FILM	75-J	1/16W	
		R504	01165104	R,CARBON FILM	2K-J	1/16W	
		R505	01165101	R,CARBON FILM	1.5K-J	1/16W	
		R506	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R507	01165128	R,CARBON FILM	20K-J	1/16W	
		R509	01165101	R,CARBON FILM	1.5K-J	1/16W	
		R510	01165097	R,CARBON FILM	1K-J	1/16W	
		R511	01165087	R,CARBON FILM	390-J	1/16W	
		R512	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R513	01165089	R,CARBON FILM	470-J	1/16W	
		R514	01165111	R,CARBON FILM	3.9K-J	1/16W	
		R516	01165121	R,CARBON FILM	10K-J	1/16W	
		R517	01165130	R,CARBON FILM	24K-J	1/16W	
		R519	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R520	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R521	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R522	01165103	R,CARBON FILM	1.8K-J	1/16W	
		R601	01165107	R,CARBON FILM	2.7K-J	1/16W	
		R602	01165121	R,CARBON FILM	10K-J	1/16W	
		R603	01165087	R,CARBON FILM	390-J	1/16W	
		R604	01165097	R,CARBON FILM	1K-J	1/16W	
		R605	01165085	R,CARBON FILM	330-J	1/16W	
		R606	01165104	R,CARBON FILM	2K-J	1/16W	
		R607	01165104	R,CARBON FILM	2K-J	1/16W	

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		R608	01165091	R,CARBON FILM	560-J	1/16W	
		R609	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R610	01165080	R,CARBON FILM	200-J	1/16W	
		R701	01165097	R,CARBON FILM	1K-J	1/16W	
		R702	01165137	R,CARBON FILM	47K-J	1/16W	
		R703	01165121	R,CARBON FILM	10K-J	1/16W	
		R704	01165111	R,CARBON FILM	3.9K-J	1/16W	
		R705	01165111	R,CARBON FILM	3.9K-J	1/16W	
		R706	01165073	R,CARBON FILM	100-J	1/16W	
		R707	01165121	R,CARBON FILM	10K-J	1/16W	
		R708	01165125	R,CARBON FILM	15K-J	1/16W	
		R709	01165073	R,CARBON FILM	100-J	1/16W	
		R710	01165121	R,CARBON FILM	10K-J	1/16W	
		R711	01165121	R,CARBON FILM	10K-J	1/16W	
		R712	01165105	R,CARBON FILM	2.2K-J	1/16W	
		R713	01165109	R,CARBON FILM	3.3K-J	1/16W	
		R714	01154073	R,CARBON FILM	100-J	1/2W	
		R715	01165107	R,CARBON FILM	2.7K-J	1/16W	
		R716	01165107	R,CARBON FILM	2.7K-J	1/16W	
		R717	01165104	R,CARBON FILM	2K-J	1/16W	
		R718	01165121	R,CARBON FILM	10K-J	1/16W	
		R719	01165087	R,CARBON FILM	390-J	1/16W	
		R720	01165087	R,CARBON FILM	390-J	1/16W	
		R721	01165087	R,CARBON FILM	390-J	1/16W	
		R722	01165087	R,CARBON FILM	390-J	1/16W	
		R723	01165087	R,CARBON FILM	390-J	1/16W	
		R724	01165087	R,CARBON FILM	390-J	1/16W	
		R725	01165087	R,CARBON FILM	390-J	1/16W	
		R726	01165087	R,CARBON FILM	390-J	1/16W	
		R727	01165121	R,CARBON FILM	10K-J	1/16W	
		R728	01165121	R,CARBON FILM	10K-J	1/16W	
		R729	01165121	R,CARBON FILM	10K-J	1/16W	
		R730	01165121	R,CARBON FILM	10K-J	1/16W	
		R731	01165123	R,CARBON FILM	12K-J	1/16W	
		R732	01165099	R,CARBON FILM	1.2K-J	1/16W	
		R733	01165121	R,CARBON FILM	10K-J	1/16W	
		R734	01165121	R,CARBON FILM	10K-J	1/16W	
		R735	01165129	R,CARBON FILM	22K-J	1/16W	
		R736	01165129	R,CARBON FILM	22K-J	1/16W	
		R737	01165129	R,CARBON FILM	22K-J	1/16W	
		R738	01165129	R,CARBON FILM	22K-J	1/16W	
		R739	01165129	R,CARBON FILM	22K-J	1/16W	
		R740	01165131	R,CARBON FILM	27K-J	1/16W	
		R741	01165121	R,CARBON FILM	10K-J	1/16W	
		R742	01165117	R,CARBON FILM	6.8K-J	1/16W	
		R743	01165115	R,CARBON FILM	5.6K-J	1/16W	
		R744	01165139	R,CARBON FILM	56K-J	1/16W	
		R745	01165125	R,CARBON FILM	15K-J	1/16W	
		R746	01157103	R,CARBON FILM	1.8K-J	1/8W	
		R747	01332065	R,METAL OXIDE FILM	47-J	1W	

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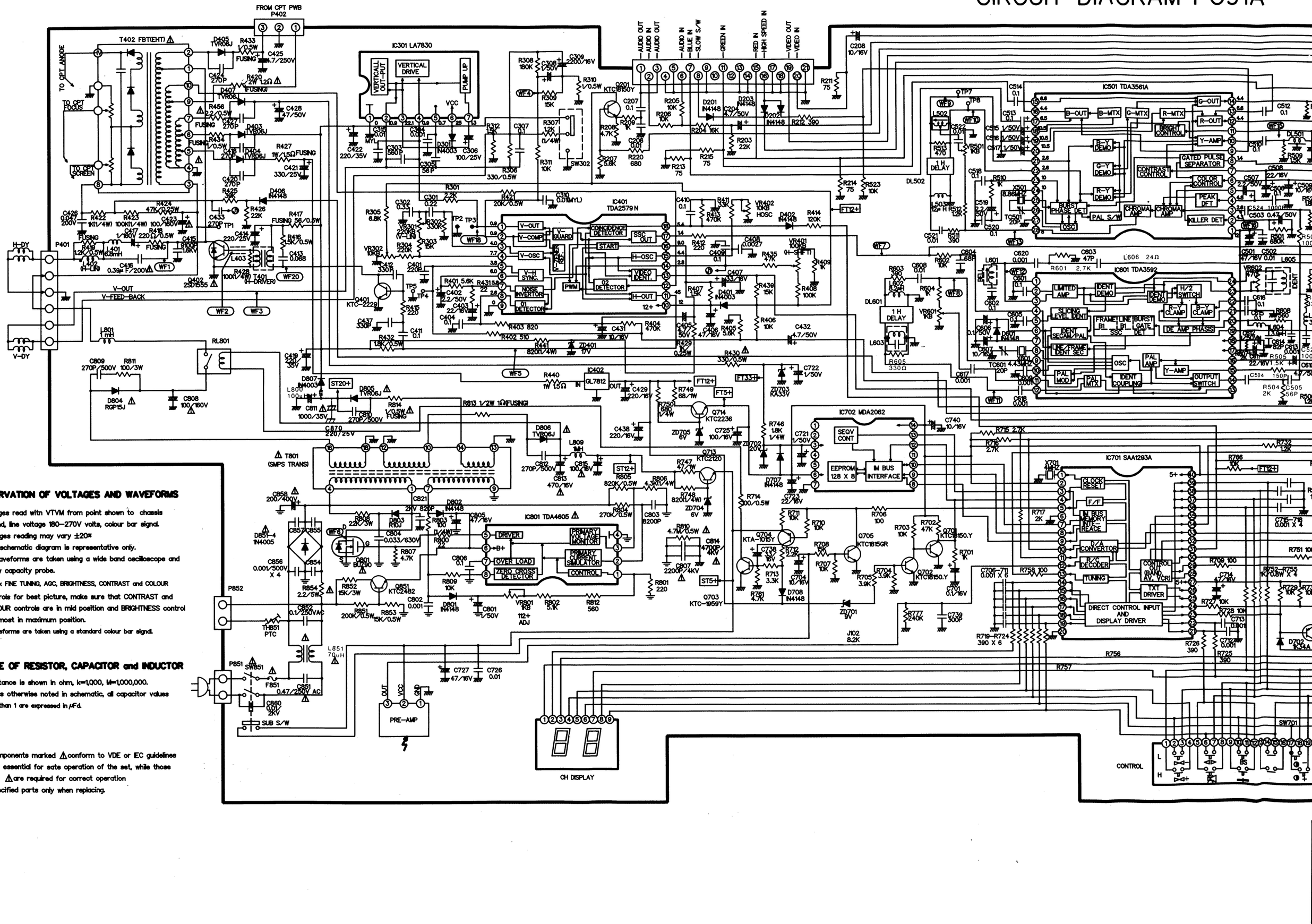
S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION		REMARKS
		R748	01157095	R,CARBON FILM	820-J	1/8W	
		R749	01332069	R,METAL OXIDE FILM	680-J	1W	
		R750	01157093	R,CARBON FILM	680-J	1/8W	
		R751	01165073	R,CARBON FILM	100-J	1/16W	
		R752	01165097	R,CARBON FILM	1K-J	1/16W	
		R753	01165097	R,CARBON FILM	1K-J	1/16W	
		R754	01165097	R,CARBON FILM	1K-J	1/16W	
		R755	01165097	R,CARBON FILM	1K-J	1/16W	
		R758	01165073	R,CARBON FILM	100-J	1/16W	
		R759	01165115	R,CARBON FILM	5.6K-J	1/16W	
		R761	01165113	R,CARBON FILM	4.7K-J	1/16W	
		R766	01165121	R,CARBON FILM	10K-J	1/16W	
		R777	01165154	R,CARBON FILM	240K-J	1/16W	
		R800	01165057	R,CARBON FILM	22-J	1/16W	
		R801	01165081	R,CARBON FILM	220-J	1/16W	
		R802	01165114	R,CARBON FILM	5.1K-J	1/16W	
		R803	01157073	R,CARBON FILM	100-J	1/8W	
		R804	01154155	R,CARBON FILM	270K-J	1/2W	
		R805	01154167	R,CARBON FILM	820K-J	1/2W	
		R806	01157112	R,CARBON FILM	4.3K-J	1/8W	
⚠		R807	01165113	R,CARBON FILM	4.7K-J	1/16W	
		R808	01341129	R,METAL OXIDE FILM	22K-J	3W	
		R809	01165121	R,CARBON FILM	10K-J	1/16W	
⚠		R810	180-042B	RESISTOR COMP GF	4.7 OHM	1/2W	
		R811	01341073	R,METAL OXIDE FILM	100-J	3W	
		R812	01165091	R,CARBON FILM	560-J	1/16W	
		R813	180-140B	R,FUSING	1.0-J	0.5W	
⚠		R814	180-140B	R,FUSING	1.0-J	0.5W	
		R851	01154152	R,CARBON FILM	200K-J	1/2W	
		R852	01341125	R,METAL OXIDE FILM	15K-J	3W	
		R853	01154125	R,CARBON FILM	15K-J	1/2W	
⚠		R854	180-142F	R,CEMENT RWR	2.2-J	5W	
		R901	01157073	R,CARBON FILM	100-J	1/8W	
		R902	01157073	R,CARBON FILM	100-J	1/8W	
		R903	01157073	R,CARBON FILM	100-J	1/8W	
		R904	01332121	R,METAL OXIDE FILM	10K-J	1W	
		R905	01332121	R,METAL OXIDE FILM	10K-J	1W	
		R906	01332121	R,METAL OXIDE FILM	10K-J	1W	
		R907	01154107	R,CARBON FILM	2.7K-J	1/2W	
		R908	01154107	R,CARBON FILM	2.7K-J	1/2W	
		R909	01154107	R,CARBON FILM	2.7K-J	1/2W	
		R910	01157103	R,CARBON FILM	1.8K-J	1/8W	
		R911	01157103	R,CARBON FILM	1.8K-J	1/8W	
		R912	01157103	R,CARBON FILM	1.8K-J	1/8W	
		R913	01157087	R,CARBON FILM	390-J	1/8W	
		R914	01157087	R,CARBON FILM	390-J	1/8W	
		R915	01157087	R,CARBON FILM	390-J	1/8W	
		R916	01157079	R,CARBON FILM	180-J	1/8W	
		R917	01157073	R,CARBON FILM	100-J	1/8W	
		R921	01157073	R,CARBON FILM	100-J	1/8W	

MODEL : BUYER NAME : RUN-DATE : 90.06.01

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		R922	01157073	R,CARBON FILM	100-J 1/8W	
		R923	01157073	R,CARBON FILM	100-J 1/8W	
		SW301	140-111C	SWITCH,	JRS-1301	
		SW701	140-277A	SWITCH	12KEY (HOKURIKU)	
		SW702	140-219A	SWITCH	TACT S/W UNIT 4P	
		SW851	140-278A	SWITCH	MAIN 70060-055(PREH)	
		TC501	181-169A	CAPACITOR	TRIMMER 4.5P-20P	
		TC601	181-169A	CAPACITOR	TRIMMER 4.5P-20P	
		TH851	163-012A	THERMISTOR	PTH451A02BG180M290	
⚠		T401	151-116B	TRANSFORMER	H.DRIVE(PC04X)	
		T402	154-177B	FBT	PAL 19INCH	
⚠		T801	151-337A	TRANSFORMER	SMPS TRANS(TDA 4605)	
		VR101	180-428H	RESISTOR	SEMI VR EVN-D4A A01 B10K OHM	
		VR301	180-425M	RESISTOR SEMI VR	220K OHM	
		VR302	180-428H	RESISTOR	SEMI VR EVN-D4A A01 B10K OHM	
		VR401	180-425L	RESISTOR SEMI VR	100K OHM	
		VR402	180-428H	RESISTOR	SEMI VR EVN-D4A A01 B10K OHM	
		VR501	180-428D	RESISTOR	SEMI VR EVN-D4A A01 B1.0KOHM	
		VR601	180-428D	RESISTOR	SEMI VR EVN-D4A A01 B1.0KOHM	
		VR602	01165087	R,CARBON FILM	390-J 1/16W	
		VR801	180-428D	RESISTOR	SEMI VR EVN-D4A A01 B1.0KOHM	
		VR901	180-428G	RESISTOR	SEMI VR EVN-D4A A01 B5.0KOHM	
		VR902	180-428G	RESISTOR	SEMI VR EVN-D4A A01 B5.0KOHM	
		VR903	180-428G	RESISTOR	SEMI VR EVN-D4A A01 B5.0KOHM	
		VR904	180-428C	RESISTOR	SEMI VR EVN-D4A A01 B500 OHM	
		VR905	180-428C	RESISTOR	SEMI VR EVN-D4A A01 B500 OHM	
		X501	156-007A	OSCILLATOR	X-TAL 8.86 MHZ	
		X601	156-006A	OSCILLATOR	X-TAL 4.43MHZ (18U)	
		X701	156-005B	OSCILLATOR	CRYSTAL,4MHZ	
		ZD401	06220124	DIODE	ZENER,EQA02-17B	
		ZD701	06220234	DIODE	ZENER Z9.1BM TA	
		ZD702	06220300	DIODE	ZENER Z20BM TA	
		ZD703	167-006B	IC	KA33V	
		ZD704	06220228	DIODE	ZENER Z5.6BM TA	
		ZD705	06220228	DIODE	ZENER Z5.6BM TA	
		Z101	166-227A	FILTER	SAW FILTER K2950	
		Z102	166-126D	FILTER	CDA 6.0MC24B	
		Z103	166-031B	FILTER	TRAP,CERAMIC TPS 5.5MB	
		Z104	166-031E	FILTER	TRAP,CERAMIC 6.5 MB	
		Z105	166-002E	FILTER	CERAMIC SFE 6.0MB	

*** END OF DATA ***

CIRCUIT DIAGRAM PC91A



OBSERVATION OF VOLTAGES AND WAVEFORMS

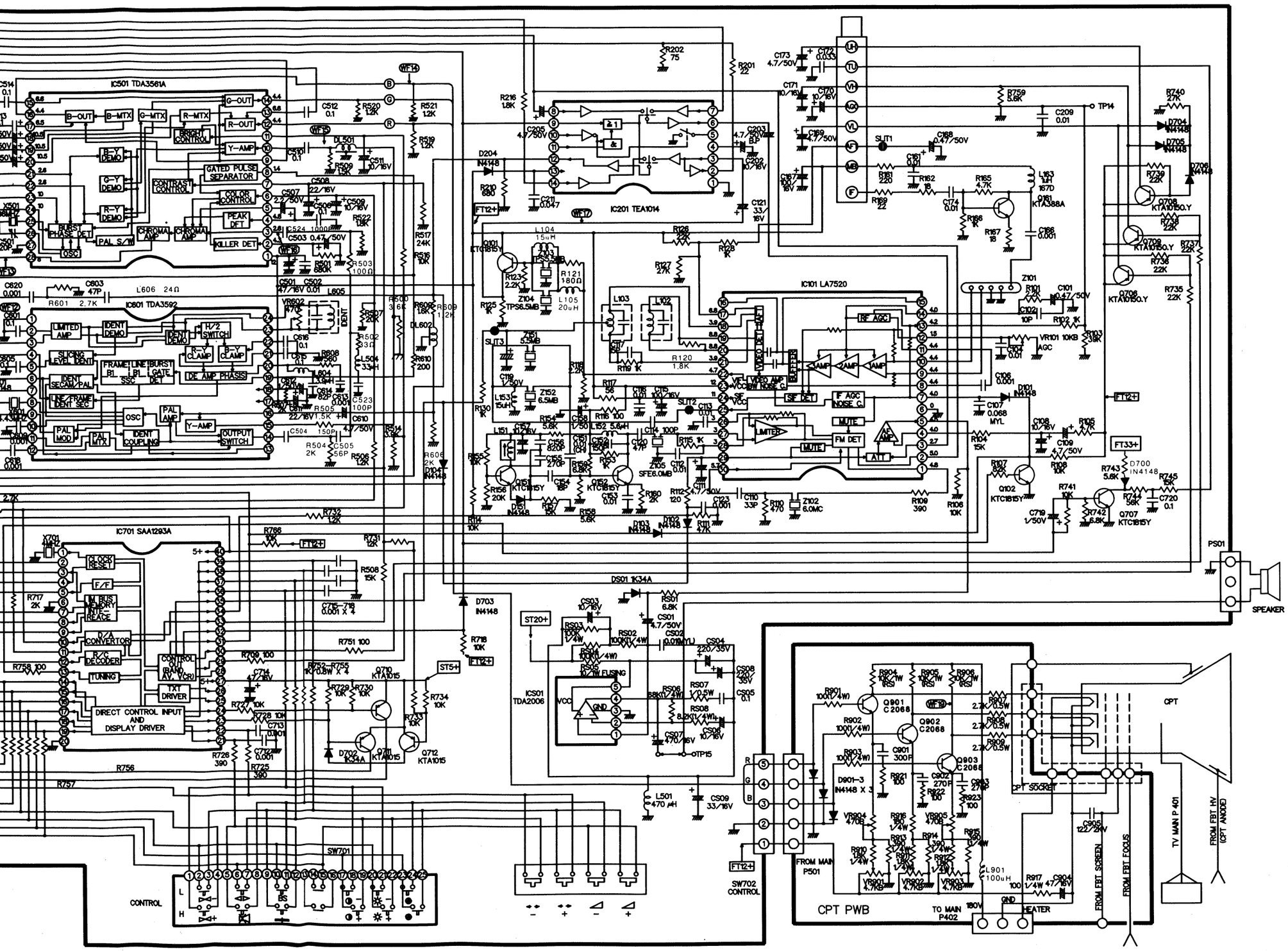
1. Voltages read with VTVM from point shown to chassis ground, line voltage 180–270V volts, colour bar signal.
2. Voltages reading may vary ±20%
3. This schematic diagram is representative only.
4. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
5. Check FINE TUNING, AGC, BRIGHTNESS, CONTRAST and COLOUR controls for best picture, make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS control is almost in maximum position.
6. Waveforms are taken using a standard colour bar signal.

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μFd.

The components marked ⚠ conform to VDE or IEC guidelines and are essential for safe operation of the set, while those marked ⚠ are required for correct operation
Use specified parts only when replacing.

CUIT DIAGRAM PC91A



NOTICE

Since this is basic circuit diagram,
the value of components and some partial connection
are subject to be changed for improvement.

WF1 1100Vp-p(-)	WF11
WF2 12Vp-p(-)	WF12 200mVp-p
WF3 50Vp-p(V)	WF13 2.5Vp-p(-)
WF4 1Vp-p(V)	WF14 7Vp-p(-)
WF5 13Vp-p(-)	WF15 500mVp-p(-)
WF6 400Vp-p	WF16 350mVp-p(-)
WF7 9Vp-p(-)	WF17 1.7Vp-p(-)
WF8 550mVp-p	WF18 4Vp-p(V)
WF9 350mVp-p(H)	WF19 95Vp-p(-)
WF10 350mVp-p(-)	WF20 100Vp-p(-)

P/N : 484-722B